



NASA SP-7039(25)
Section 1
Abstracts

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ABSTRACTS BIBLIOGRAPHY, A CONTINUING
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Space Administration) 49 p HC \$10.00

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NASA

PATENT

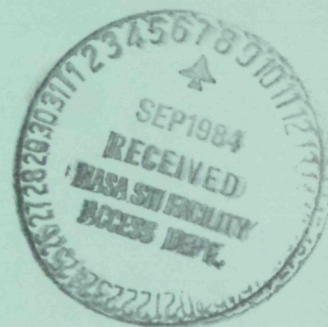
ABSTRACTS

BIBLIOGRAPHY

A CONTINUING BIBLIOGRAPHY

Section 1 • Abstracts

JULY 1984



NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

NASA SP-7039(25)

NASA Patent Abstracts Bibliography

III V 1084

ACCESSION NUMBER RANGES

<i>Bibliography Number</i>	<i>STAR Accession Numbers</i>
NASA SP-7039(04)	N69-20701 – N73-33931
NASA SP-7039(12)	N74-10001 – N77-34042
NASA SP-7039(13)	N78-10001 – N78-22018
NASA SP-7039(14)	N78-22019 – N78-34034
NASA SP-7039(15)	N79-10001 – N79-21993
NASA SP-7039(16)	N79-21994 – N79-34158
NASA SP-7039(17)	N80-10001 – N80-22254
NASA SP-7039(18)	N80-22255 – N80-34339
NASA SP-7039(19)	N81-10001 – N81-21997
NASA SP-7039(20)	N81-21998 – N81-34139
NASA SP-7039(21)	N82-10001 – N82-22140
NASA SP-7039(22)	N82-22141 – N82-34341
NASA SP-7039(23)	N83-10001 – N83-23266
NASA SP-7039(24)	N83-23267 – N83-37053
NASA SP-7039(25)	N84-10001 – N84-22526

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NASA

**PATENT
ABSTRACTS
BIBLIOGRAPHY**

A CONTINUING BIBLIOGRAPHY

Section 1 • Abstracts

Annotated references to NASA-owned inventions covered by U.S. patents and applications for patent that were announced in *Scientific and Technical Aerospace Reports (STAR)* between January 1984 and June 1984.



Scientific and Technical Information Branch 1984
National Aeronautics and Space Administration
Washington, DC

This supplement is available as NTISUB/111/093 from the National Technical Information Service (NTIS), Springfield, Virginia 22161 at the price of \$10.00 domestic; \$20.00 foreign for standing orders. Please note: Standing orders are subscriptions which do not terminate at the end of a year, as do regular subscriptions, but continue indefinitely unless specifically terminated by the subscriber.

INTRODUCTION

Several thousand inventions result each year from the aeronautical and space research supported by the National Aeronautics and Space Administration. The inventions having important use in government programs or significant commercial potential are usually patented by NASA. These inventions cover practically all fields of technology and include many that have useful and valuable commercial application.

NASA inventions best serve the interests of the United States when their benefits are available to the public. In many instances, the granting of nonexclusive or exclusive licenses for the practice of these inventions may assist in the accomplishment of this objective. This bibliography is published as a service to companies, firms, and individuals seeking new, licensable products for the commercial market.

The *NASA Patent Abstracts Bibliography (NASA PAB)* is a semiannual NASA publication containing comprehensive abstracts and indexes of NASA-owned inventions covered by U.S. patents and applications for patent. The citations included in *NASA PAB* were originally published in NASA's *Scientific and Technical Aerospace Reports (STAR)* and cover *STAR* announcements made since May 1969.

For the convenience of the user, each issue of *NASA PAB* has a separately bound Abstract Section (Section 1) and Index Section (Section 2). Although each Abstract Section covers only the indicated six-month period, the Index Section is cumulative covering all NASA-owned inventions announced in *STAR* since 1969. Thus a complete set of *NASA PAB* would consist of the Abstract Sections of Issue 04 (January 1974) and Issue 12 (January 1978) and the Abstract Section for all subsequent issues and the Index Section for the most recent issue.

The 102 citations published in this issue of the Abstract Section cover the period January 1984 through June 1984. The Index Section references over 4300 citations covering the period May 1969 through June 1984.

ABSTRACT SECTION (SECTION 1)

This *PAB* issue incorporates the 1975 *STAR* category revisions which include 10 major subdivisions divided into 74 specific categories and one general category/division. (See Table of Contents for the scope note of each category under which are grouped appropriate NASA inventions.) This new scheme was devised in lieu of the 34 category divisions which were utilized in *PAB* supplements (01) through (06) covering *STAR* abstracts from May 1969 through January 1974. Each entry in the Abstract Section consists of a *STAR* citation accompanied by an abstract and a key illustration taken from the patent or application for patent drawing. Entries are arranged in subject category in order of the ascending NASA Accession Number originally assigned in *STAR* to the invention. The range of NASA Accession Numbers within each issue is printed on the inside front cover.

Abstract Citation Data Elements: Each of the abstract citations has several data elements useful for identification and indexing purposes, as follows:

- NASA Accession Number
- NASA Case Number
- Inventor's Name
- Title of Invention
- U.S. Patent Application Serial Number
- U.S. Patent Number (for issued patents only)
- U.S. Patent Office Classification Number(s)
(for issued patents only)

These data elements in the citation of the abstract are depicted in the Typical Citation and Abstract reproduced on the following page and are also used in the indexes.

TYPICAL CITATION AND ABSTRACT

NASA SPONSORED DOCUMENT → **N84-20782*** → **National Aeronautics and Space Administration.** → **AVAILABLE ON MICROFICHE**

NASA ACCESSION NUMBER → **VORTEX GENERATING FLOW PASSAGE DESIGN FOR INCREASED FILM COOLING EFFECTIVENESS** → **SOURCE**

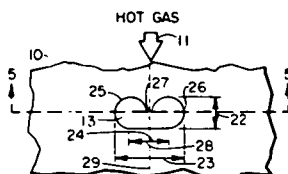
TITLE → **Application**

INVENTOR → **S. S. PAPELL, inventor (to NASA) 15 Feb. 1984 15 p** → **US PATENT APPLICATIONS SERIAL NUMBER**

NASA CASE NUMBER → **(NASA-CASE-LEW-14039-1; US-PATENT-APPL-SN-580419)**

AVAILABILITY → **Avail: NTIS HC A02/MF A01 CSCL 20D** → **COSATI CODE**

ABSTRACT → **A cooling fluid is injected into a hot flowing gas through a passageway in a wall which contains and is subject to the hot gas. The passageway is slanted in a downstream direction at an acute angle to the wall. A cusp shape is provided in the passageway to generate vortices in the injected cooling fluid thereby reducing the energy extracted from the hot gas for that purpose. The cusp shape increases both film cooling effectiveness and wall area coverage. The cusp may be at either the downstream or upstream side of the passageway, the former substantially eliminating flow separation of the cooling fluid from the wall immediately downstream of the passageway.** → **NASA**



KEY ILLUSTRATION

INDEX SECTION (SECTION 2)

The Index Section is divided into five indexes which are cross-indexed and are useful in locating a single invention or groups of inventions.

Each of the five indexes utilizes basic data elements: (1) Subject Category Number, (2) NASA Accession Number, and (3) NASA Case Number, in addition to other specific index terms.

Subject Index: Lists all inventions according to appropriate alphabetized technical term and indicates the related NASA Case Number, the Subject Category Number, and the NASA Accession Number.

Inventor Index: Lists all inventions according to alphabetized names of inventors and indicates the related NASA Case Number, the Subject Category Number, and the NASA Accession Number.

Source Index: Lists all inventions according to alphabetized source of invention (i.e., name of contractor or government installation where invention was made) and indicates the related NASA Case Number, the Subject Category Number, and the NASA Accession Number.

Number Index: Lists inventions in order of ascending (1) NASA Case Number, (2) U.S. Patent Application Serial Number, (3) U.S. Patent Classification Number, and (4) U.S. Patent Number and indicates the related Subject Category Number and the NASA Accession Number.

Accession Number Index: Lists all inventions in order of ascending NASA Accession Number and indicates the related Subject Category Number, the NASA Case Number, the U.S. Patent Application Serial Number, the U.S. Patent Classification Number, and the U.S. Patent Number.

HOW TO USE THIS PUBLICATION TO IDENTIFY NASA INVENTIONS

To identify one or more NASA inventions within a specific technical field or subject, several techniques are possible when using the flexibility incorporated into the *NASA PAB*.

(1) *Using Subject Category:* To identify all NASA inventions in any one of the subject categories in this issue of *NASA PAB*, select the desired Subject Category in the Abstract Section (Section 1) and find the inventions abstracted thereunder.

(2) *Using Subject Index:* To identify all NASA inventions listed under a desired technical subject index term, (A) turn to the cumulative Subject Index in the Index Section and find the invention(s) listed under the desired technical subject term. (B) Note the indicated Accession Number and the Subject Category Number. (C) Using the indicated Accession Number, turn to the inside front cover of the Index Section to determine which issue of the Abstract Section includes the Accession Number desired. (D) To find the abstract of the particular invention in the issue of the Abstract Section selected, (i) use the Subject Category Number to locate the Subject Category and (ii) use the Accession Number to locate the desired invention within the Subject Category listing.

(3) *Using Patent Classification Index:* To identify all inventions covered by issued NASA patents (does not include applications for patent) within a desired Patent Classification, (A) turn to the Patent Classification Number in the Number Index of Section 2 and find the associated invention(s), and (B) follow the instructions outlined in (2)(B), and (D) above.

PUBLIC AVAILABILITY OF COPIES OF PATENTS AND PATENT APPLICATIONS

Copies of U.S. patents may be purchased directly from the U.S. Patent and Trademark Office, Washington, D.C. 20231, for fifty cents a copy. When ordering patents, the U.S. Patent Number should be used, and payment must be remitted in advance, preferably by money order or check payable to the Commissioner of Patents and Trademarks. Prepaid purchase coupons for ordering are also available from the Patent and Trademark Office.

NASA *patent application specifications* are sold in paper copy by the National Technical Information Service at price code A02 (\$7.00 domestic; \$14.00 foreign). Microfiche are sold at price code A01 (\$4.50 domestic; \$9.00 foreign). The US-Patent-Appl-SN-number should be used in ordering either paper copy or microfiche from NTIS.

LICENSES FOR COMMERCIAL USE: INQUIRIES AND APPLICATIONS FOR LICENSE

NASA inventions, abstracted in *NASA PAB*, are available for nonexclusive or exclusive licensing in accordance with the NASA Patent Licensing Regulations. It is significant that all licenses for NASA inventions shall be by express written instruments and that no license will be granted or implied in a NASA invention except as provided in the NASA Patent Licensing Regulations.

Inquiries concerning the NASA Patent Licensing Program or the availability of licenses for the commercial use of NASA-owned inventions covered by U.S. patents or pending applications for patent should be forwarded to the NASA Patent Counsel of the NASA installation having cognizance of the specific invention, or the Assistant General Counsel for Patent Matters, Code GP-4, National Aeronautics and Space Administration, Washington, D.C. 20546. Inquiries should refer to the NASA Case Number, the Title of the Invention, and the U.S. Patent Number or the U.S. Application Serial Number assigned to the invention as shown in *NASA PAB*.

The NASA Patent Counsel having cognizance of the invention is determined by the first three letters or prefix of the NASA Case Number assigned to the invention. The addresses of NASA Patent Counsels are listed alongside the NASA Case Number prefix letters in the following table. Formal application of license must be submitted on the NASA Form, Application for NASA Patent License, which is available upon request from any NASA Patent Counsel.

**NASA Case
Number
Prefix Letters**

**Address of Cognizant
NASA Patent Counsel**

ARC-xxxxx
XAR-xxxxx

Ames Research Center
Mail Code: 200-11A
Moffett Field, California 94035
Telephone: (415)965-5104

ERC-xxxxx
XER-xxxxx
HQN-xxxxx
XHQ-xxxxx

NASA Headquarters
Mail Code: GP-4
Washington, D.C. 20546
Telephone: (202)755-3954

GSC-xxxxx
XGS-xxxxx

Goddard Space Flight Center
Mail Code: 204
Greenbelt, Maryland 20771
Telephone: (301)344-7351

KSC-xxxxx
XKS-xxxxx

John F. Kennedy Space Center
Mail Code: PT-PAT
Kennedy Space Center, Florida 32899
Telephone: (305)867-2544

LAR-xxxxx
XLA-xxxxx

Langley Research Center
Mail Code: 279
Hampton, Virginia 23365
Telephone: (804)827-8725

LEW-xxxxx
XLE-xxxxx

Lewis Research Center
Mail Code: 500-318
21000 Brookpark Road
Cleveland, Ohio 44135
Telephone: (216)433-6346

MSC-xxxxx
XMS-xxxxx

Lyndon B. Johnson Space Center
Mail Code: AL3
Houston, Texas 77058
Telephone: (713)483-4871

MFS-xxxxx
XMF-xxxxx

George C. Marshall Space Flight Center
Mail Code: CC01
Huntsville, Alabama 35812
Telephone: (205)453-0020

NPO-xxxxx
XNP-xxxxx
FRC-xxxxx
XFR-xxxxx
WOO-xxxxx

NASA Resident Legal Office
Mail Code: 180-801
4800 Oak Grove Drive
Pasadena, California 91103
Telephone: (213)354-2700

PATENT LICENSING REGULATIONS

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

14 CFR Part 1245

Licensing of NASA Inventions

AGENCY: National Aeronautics and Space Administration.

ACTION: Interim regulation with comments requested.

SUMMARY: The National Aeronautics and Space Administration (NASA) is revising its patent licensing regulations to conform with Pub. L. 96-517. This interim regulation provides policies and procedures applicable to the licensing of federally owned inventions in the custody of the National Aeronautics and Space Administration, and implements Pub. L. 96-517. The object of this subpart is to use the patent system to promote the utilization of inventions arising from NASA supported research and development.

EFFECTIVE DATE: July 1, 1981. Comments must be received in writing by December 2, 1981. Unless a notice is published in the *Federal Register* after the comment period indicating changes to be made, this interim regulation shall become a final regulation.

ADDRESS: Mr. John G. Mannix, Director of Patent Licensing, GP-4, NASA, Washington, D.C. 20546.

FOR FURTHER INFORMATION CONTACT: Mr. John G. Mannix, (202) 755-3954

SUPPLEMENTARY INFORMATION:

PART 1245—PATENTS AND OTHER INTELLECTUAL PROPERTY RIGHTS

Subpart 2 of Part 1245 is revised to read as follows:

Subpart 2—Licensing of NASA Inventions

Sec.

1245.200 Scope of subpart.

1245.201 Policy and objective.

1245.202 Definitions.

1245.203 Authority to grant licenses.

Restrictions and Conditions

1245.204 All licenses granted under this subpart.

Types of Licenses

1245.205 Nonexclusive licenses.

1245.206 Exclusive and partially exclusive licenses.

Procedures

1245.207 Application for a license.

1245.208 Processing applications.

1245.209 Notice to Attorney General.

1245.210 Modification and termination of licenses.

1245.211 Appeals.

1245.212 Protection and administration of inventions.

1245.213 Transfer of custody.

1245.214 Confidentiality of information.

Authority: 35 U.S.C. Section 207 and 208, 94 Stat. 3023 and 3024.

Subpart 2—Licensing of NASA Inventions

§ 1245.200 Scope of subpart.

This subpart prescribes the terms, conditions, and procedures upon which a NASA invention may be licensed. It does not affect licenses which (a) were in effect prior to July 1, 1981; (b) may exist at the time of the Government's acquisition of title to the invention, including those resulting from the allocation of rights to inventions made under Government research and development contracts; (c) are the result of an authorized exchange of rights in the settlement of patent disputes; or (d) are otherwise authorized by law or treaty.

§ 1245.201 Policy and objective.

It is the policy and objective of this subpart to use the patent system to promote the utilization of inventions arising from NASA supported research and development.

§ 1245.202 Definitions.

(a) "Federally owned invention" means an invention, plant, or design which is covered by a patent, or patent application in the United States, or a patent, patent application, plant variety protection, or other form of protection, in a foreign country, title to which has been assigned to or otherwise vested in the United States Government.

(b) "Federal agency" means an executive department, military department, Government corporation, or independent establishment, except the Tennessee Valley Authority, which has custody of a Federally owned invention.

(c) "NASA Invention" means a Federally owned invention with respect to which NASA maintains custody and administration, in whole or in part, of the right, title, or interest in such invention on behalf of the United States Government.

(d) "Small business firm" means a small business concern as defined at section 2 of Pub. L. 85-536 (15 U.S.C. 632) and implementing regulations of the Administrator of the Small Business Administration. For the purpose of these regulations, the size standard for small business concerns involved in Government procurement, contained in 13 CFR 121.3-8, and in subcontracting, contained in 13 CFR 121.3-12, will be used.

(e) "Practical application" means to manufacture in the case of a composition or product, to practice in the case of a process or method, or to

operate in the case of a machine or system; and, in each case, under such conditions as to establish that the invention is being utilized and that its benefits are to the extent permitted by law or Government regulations available to the public on reasonable terms.

(f) "United States" means the United States of America, its territories and possessions, the District of Columbia, and the Commonwealth of Puerto Rico.

§ 1245.203 Authority to grant licenses.

NASA inventions shall be made available for licensing as deemed appropriate in the public interest. NASA may grant nonexclusive, partially exclusive, or exclusive licenses thereto under this subpart on inventions in its custody.

Restrictions and Conditions

§ 1245.204 All licenses granted under this subpart.

(a) *Restrictions.* (1) A license may be granted only if the applicant has supplied NASA with a satisfactory plan for development or marketing of the invention, or both, and with information about the applicant's capability to fulfill the plan.

(2) A license granting rights to use or sell under a NASA invention in the United States shall normally be granted only to a licensee who agrees that any products embodying the invention or produced through the use of the invention will be manufactured substantially in the United States.

(b) *Conditions.* Licenses shall contain such terms and conditions as NASA determines are appropriate for the protection of the interests of the Federal Government and the public and are not in conflict with law or this subpart. The following terms and conditions apply to any license:

(1) The duration of the license shall be for a period specified in the license agreement, unless sooner terminated in accordance with this subpart.

(2) The license may be granted for all or less than all fields of use of the invention or in specified geographical areas or both.

(3) The license may extend to subsidiaries of the licensee or other parties if provided for in the license but shall be nonassignable without approval of NASA, except to the successor of that part of the licensee's business to which the invention pertains.

(4) The license may provide the licensee the right to grant sublicenses under the license, subject to the approval of NASA. Each sublicense shall make reference to the license, including the rights retained by the Government, and a copy of such

sublicense shall be furnished to NASA.

(5) The license shall require the licensee to carry out the plan for development or marketing of the invention, or both, to bring the invention to practical application within a period specified in the license, and to continue to make the benefits of the invention reasonably accessible to the public.

(6) The license shall require the licensee to report periodically on the utilization or efforts at obtaining utilization that are being made by the licensee, with particular reference to the plan submitted.

(7) All licenses shall normally require royalties or other consideration.

(8) Where an agreement is obtained pursuant to § 1245.204(a)(2) that any products embodying the invention or produced through use of the invention will be manufactured substantially in the United States, the license shall recite such agreement.

(9) The license shall provide for the right of NASA to terminate the license, in whole or in part, if:

(i) NASA determines that the licensee is not executing the plan submitted with its request for a license and the licensee cannot otherwise demonstrate to the satisfaction of NASA that it has taken or can be expected to take within a reasonable time effective steps to achieve practical application of the invention;

(ii) NASA determines that such action is necessary to meet requirements for public use specified by Federal regulations issued after the date of the license and such requirements are not reasonably satisfied by the licensee;

(iii) The licensee has willfully made a false statement of or willfully omitted a material fact in the license application or in any report required by the license agreement; or

(iv) The licensee commits a substantial breach of a covenant or agreement contained in the license.

(10) The license may be modified or terminated, consistent with this subpart, upon mutual agreement of NASA and the licensee.

(11) Nothing relating to the grant of a license, nor the grant itself, shall be construed to confer upon any person any immunity from or defenses under the antitrust laws or from a charge of patent misuse, and the acquisition and use of rights pursuant to this subpart shall not be immunized from the operation of state or Federal law by reason of the source of the grant.

Types of Licenses

§ 1245.205 Nonexclusive licenses.

(a) Availability of licenses.

Nonexclusive licenses may be granted under NASA inventions without publication of availability or notice of a prospective license.

(b) *Conditions.* In addition to the provisions of § 1245.204, the nonexclusive license may also provide that, after termination of a period specified in the license agreement, NASA may restrict the license to the fields of use or geographic areas, or both, in which the licensee has brought the invention to practical application and continues to make the benefits of the invention reasonably accessible to the public. However, such restriction shall be made only in order to grant an exclusive or partially exclusive license in accordance with this subpart.

§ 1245.206 Exclusive and partially exclusive licenses.

(a) Domestic licenses.

(1) *Availability of licenses.* Exclusive or partially exclusive licenses may be granted on NASA inventions: (i) 3 months after notice of the invention's availability has been announced in the **Federal Register**; or (ii) without such notice where NASA determines that expeditious granting of such a license will best serve the interests of the Federal Government and the public; and (iii) in either situation, specified in (a)(1)(i) or (ii) of this section only if:

(A) Notice of a prospective license, identifying the invention and the prospective licensee, has been published in the **Federal Register**, providing opportunity for filing written objections within a 60-day period;

(B) After expiration of the period in § 1245.206(a) (1)(iii)(A) and consideration of any written objections received during the period, NASA has determined that:

(1) The interests of the Federal Government and the public will best be served by the proposed license, in view of the applicant's intentions, plans, and ability to bring the invention to practical application or otherwise promote the invention's utilization by the public;

(2) The desired practical application has not been achieved, or is not likely expeditiously to be achieved, under any nonexclusive license which has been granted, or which may be granted, on the invention;

(3) Exclusive or partially exclusive licensing is a reasonable and necessary incentive to call forth the investment of risk capital and expenditures to bring the invention to practical application or

otherwise promote the invention's utilization by the public; and

(4) The proposed terms and scope of exclusivity are not greater than reasonably necessary to provide the incentive for bringing the invention to practical application or otherwise promote the invention's utilization by the public;

(C) NASA has not determined that the grant of such license will tend substantially to lessen competition or result in undue concentration in any section of the country in any line of commerce to which the technology to be licensed relates, or to create or maintain other situations inconsistent with the antitrust laws; and

(D) NASA has given first preference to any small business firms submitting plans that are determined by the agency to be within the capabilities of the firms and as equally likely, if executed, to bring the invention to practical application as any plans submitted by applicants that are not small business firms.

(2) *Conditions.* In addition to the provisions of § 1245.204, the following terms and conditions apply to domestic exclusive and partially exclusive licenses:

(i) The license shall be subject to the irrevocable, royalty-free right of the Government of the United States to practice and have practiced the invention on behalf of the United States and on behalf of any foreign government or international organization pursuant to any existing or future treaty or agreement with the United States.

(ii) The license shall reserve to NASA the right to require the licensee to grant sublicenses to responsible applicants, on reasonable terms, when necessary to fulfill health or safety needs.

(iii) The license shall be subject to any licenses in force at the time of the grant of the exclusive or partially exclusive license.

(iv) The license may grant the licensee the right of enforcement of the licensed patent pursuant to the provisions of Chapter 29 of Title 35, United States Code, or other statutes, as determined appropriate in the public interest.

(b) Foreign licenses.

(1) *Availability of licenses.* Exclusive or partially exclusive licenses may be granted on a NASA invention covered by a foreign patent, patent application, or other form of protection, provided that:

(i) Notice of a prospective license, identifying the invention and prospective licensee, has been published in the **Federal Register**, providing opportunity for filing written objections

PATENT LICENSING REGULATIONS

within a 60-day period and following consideration of such objections;

(ii) NASA has considered whether the interests of the Federal Government or United States industry in foreign commerce will be enhanced; and

(iii) NASA has not determined that the grant of such license will tend substantially to lessen competition or result in undue concentration in any section of the United States in any line of commerce to which the technology to be licensed relates, or to create or maintain other situations inconsistent with antitrust laws.

(2) *Conditions.* In addition to the provisions of § 1245.204, the following terms and conditions apply to foreign exclusive and partially exclusive licenses:

(i) The license shall be subject to the irrevocable, royalty-free right of the Government of the United States to practice and have practiced the invention on behalf of the United States and on behalf of any foreign government or international organization pursuant to any existing or future treaty or agreement with the United States.

(ii) The license shall be subject to any licenses in force at the time of the grant of the exclusive or partially exclusive license.

(iii) The license may grant the licensee the right to take any suitable and necessary actions to protect the licensed property, on behalf of the Federal Government.

(c) *Record of determinations.* NASA shall maintain a record of determinations to grant exclusive or partially exclusive licenses.

Procedures

§ 1245.207 Application for a license.

An application for a license should be addressed to the Patent Counsel at the NASA installation having responsibility for the invention and shall normally include:

(a) Identification of the invention for which the license is desired, including the patent application serial number or patent number, title, and date, if known;

(b) Identification of the type of license for which the application is submitted;

(c) Name and address of the person, company, or organization applying for the license and the citizenship or place of incorporation of the applicant;

(d) Name, address, and telephone number of representative of applicant to whom correspondence should be sent;

(e) Nature and type of applicant's business, identifying products or services which the applicant has successfully commercialized, and

approximate number of applicant's employees;

(f) Source of information concerning the availability of a license on the invention;

(g) A statement indicating whether applicant is a small business firm as defined in § 1245.202(c);

(h) A detailed description of applicant's plan for development or marketing of the invention, or both, which should include:

(1) A statement of the time, nature and amount of anticipated investment of capital and other resources which applicant believes will be required to bring the invention to practical application;

(2) A statement as to applicant's capability and intention to fulfill the plan, including information regarding manufacturing, marketing, financial, and technical resources;

(3) A statement of the fields of use for which applicant intends to practice the invention; and

(4) A statement of the geographic areas in which applicant intends to manufacture any products embodying the invention and geographic areas where applicant intends to use or sell the invention, or both;

(i) Identification of licenses previously granted to applicant under Federally owned inventions;

(j) A statement containing applicant's best knowledge of the extent to which the invention is being practiced by private industry or Government, or both, or is otherwise available commercially; and

(k) Any other information which applicant believes will support a determination to grant the license to applicant.

§ 1245.208 Processing applications.

(a) Applications for licenses will be initially reviewed by the Patent Counsel of the NASA installation having responsibility for the invention. The Patent Counsel shall make a preliminary recommendation to the Director of Licensing, NASA Headquarters, whether to: (1) grant the license as requested, (2) grant the license with modification after negotiation with the licensee, or (3) deny the license. The Director of Licensing shall review the preliminary recommendation of the Patent Counsel and make a final recommendation to the NASA Assistant General Counsel for Patent Matters. Such review and final recommendation may include, and be based on, any additional information obtained from applicant and other sources that the Patent Counsel and the Director of Licensing deem relevant to

the license requested. The determination to grant or deny the license shall be made by the Assistant General Counsel for Patent Matters based on the final recommendation of the Director of Licensing.

(b) When notice of a prospective exclusive or partially exclusive license is published in the Federal Register in accordance with § 1245.206(a)(1)(iii)(A) or § 1245.206(b)(1)(i), any written objections received in response thereto will be considered by the Director of Licensing in making the final recommendation to the Assistant General Counsel for Patent Matters.

(c) If the requested license, including any negotiated modifications, is denied by the Assistant General Counsel for Patent Matters, the applicant may request reconsideration by filing a written request for reconsideration within 30 days after receiving notice of denial. This 30-day period may be extended for good cause.

(d) In addition to, or in lieu of requesting reconsideration, the applicant may also appeal the denial of the license in accordance with § 1245.211.

§ 1245.209 Notice to Attorney General.

A copy of the notice provided for in §§ 1245.206(a)(1)(iii)(A), and 1245.206(b)(1)(i) will be sent to the Attorney General.

§ 1245.210 Modification and termination of licenses.

Before modifying or terminating a license, other than by mutual agreement, NASA shall furnish the licensee and any sublicensee of record a written notice of intention to modify or terminate the license, and the licensee and any sublicensee shall be allowed 30 days after such notice to remedy any breach of the license or show cause why the license should not be modified or terminated.

§ 1245.211 Appeals.

(a) The following parties may appeal to the NASA Administrator or designee any decision or determination concerning the grant, denial, interpretation, modification, or termination of a license:

(1) A person whose application for a license has been denied;

(2) A licensee whose license has been modified or terminated, in whole or in part; or

(3) A person who timely filed a written objection in response to the notice required by

§ § 1245.208(a)(1)(iii)(A) or

PATENT LICENSING REGULATIONS

1245.206(b)(1)(i) and who can demonstrate to the satisfaction of NASA that such person may be damaged by the Agency action.

(b) Written notice of appeal must be filed within 30 days (or such other time as may be authorized for good cause shown) after receiving notice of the adverse decision or determination; including, an adverse decision following the request for reconsideration under § 1245.208(c). The notice of appeal, along with all supporting documentation should be addressed to the Administrator, National Aeronautics and Space Administration, Washington, DC 20546. Should the appeal raise a genuine dispute over material facts, fact-finding will be conducted by the NASA Inventions and Contributions Board. The person filing the appeal shall be

afforded an opportunity to be heard and to offer evidence in support of the appeal. The Chairperson of the Inventions and Contributions Board shall prepare written findings of fact and transmit them to the Administrator or designee. The decision on the appeal shall be made by the NASA Administrator or designee. There is no further right of administrative appeal from the decision of the Administrator or designee.

§ 1245.212 Protection and administration of inventions.

NASA may take any suitable and necessary steps to protect and administer rights to NASA inventions, either directly or through contract.

§ 1245.213 Transfer of custody.

NASA having custody of certain Federally owned inventions may transfer custody and administration in whole or in part, to another Federal agency, of the right, title, or interest in any such invention.

§ 1245.214 Confidentiality of information.

Title 35, United States Code, section 209, provides that any plan submitted pursuant to § 1245.207(h) and any report required by § 1245.204(b)(6) may be treated by NASA as commercial and financial information obtained from a person and privileged and confidential and not subject to disclosure under section 552 of Title 5 of the United States Code.

James M. Beggs,
Administrator.

October 15, 1981.

[FR Doc. 81-31809 Filed 10-30-81; 8:45 am]

BILLING CODE 7510-01-M

FOREIGN PATENT LICENSING REGULATIONS

Selected NASA inventions are also available for licensing in countries other than the United States in accordance with the NASA Foreign Patent Licensing Regulation (14 C.F.R. 1245.4), a copy of which is available from any NASA Patent Counsel. For abstracts of NASA-owned inventions available for licensing in countries other than the United States, see NASA SP-7038, "Significant NASA Inventions Available for Licensing in Countries Other Than the United States." A copy of this NASA publication is available from NASA Headquarters, Code GP-4, Washington, D.C., 20546

TABLE OF CONTENTS

Section 1 • Abstracts

AERONAUTICS

Includes aeronautics (general); aerodynamics; air transportation and safety; aircraft communications and navigation; aircraft design, testing and performance; aircraft instrumentation; aircraft propulsion and power; aircraft stability and control; and research and support facilities (air).

For related information see also *Astronautics*.

01 AERONAUTICS (GENERAL) N.A.

02 AERODYNAMICS 1

Includes aerodynamics of bodies, combinations, wings, rotors, and control surfaces; and internal flow in ducts and turbomachinery.

For related information see also *34 Fluid Mechanics and Heat Transfer*

03 AIR TRANSPORTATION AND SAFETY N.A.

Includes passenger and cargo air transport operations; and aircraft accidents.

For related information see also *16 Space Transportation* and *85 Urban Technology and Transportation*.

04 AIRCRAFT COMMUNICATIONS AND NAVIGATION 2

Includes digital and voice communication with aircraft; air navigation systems (satellite and ground based); and air traffic control.

For related information see also *17 Spacecraft Communications, Command and Tracking* and *32 Communications*.

05 AIRCRAFT DESIGN, TESTING AND PERFORMANCE 2

Includes aircraft simulation technology.

For related information see also *18 Spacecraft Design, Testing and Performance* and *39 Structural Mechanics*.

06 AIRCRAFT INSTRUMENTATION 3

Includes cockpit and cabin display devices; and flight instruments.

For related information see also *19 Spacecraft Instrumentation* and *35 Instrumentation and Photography*.

07 AIRCRAFT PROPULSION AND POWER N.A.

Includes prime propulsion systems and systems components, e.g., gas turbine engines and compressors; and on-board auxiliary power plants for aircraft.

For related information see also *20 Spacecraft Propulsion and Power*, *28 Propellants and Fuels*, and *44 Energy Production and Conversion*.

08 AIRCRAFT STABILITY AND CONTROL N.A.

Includes aircraft handling qualities; piloting; flight controls; and autopilots.

09 RESEARCH AND SUPPORT FACILITIES (AIR) 3

Includes airports, hangars and runways; aircraft repair and overhaul facilities; wind tunnels; shock tube facilities; and engine test blocks.

For related information see also *14 Ground Support Systems and Facilities (Space)*.

ASTRONAUTICS

Includes astronautics (general); astrodynamics; ground support systems and facilities (space); launch vehicles and space vehicles; space transportation; spacecraft communications, command and tracking; spacecraft design, testing and performance; spacecraft instrumentation; and spacecraft propulsion and power.

For related information see also *Aeronautics*

12 ASTRONAUTICS (GENERAL) N.A.

For extraterrestrial exploration see *91 Lunar and Planetary Exploration*.

13 ASTRODYNAMICS N.A.

Includes powered and free-flight trajectories; and orbit and launching dynamics.

14 GROUND SUPPORT SYSTEMS AND FACILITIES (SPACE) N.A.

Includes launch complexes, research and production facilities; ground support equipment, e.g., mobile transporters; and simulators.

For related information see also *09 Research and Support Facilities (Air)*.

15 LAUNCH VEHICLES AND SPACE VEHICLES N.A.

Includes boosters; manned orbital laboratories; reusable vehicles; and space stations.

16 SPACE TRANSPORTATION N.A.

Includes passenger and cargo space transportation, e.g., shuttle operations; and rescue techniques.

For related information see also *03 Air Transportation and Safety* and *85 Urban Technology and Transportation*.

17 SPACECRAFT COMMUNICATION, COMMAND AND TRACKING N.A.

Includes telemetry; space communications networks; astronavigation; and radio blackout.

For related information see also *04 Aircraft Communications and Navigation* and *32 Communications*.

18 SPACECRAFT DESIGN, TESTING AND PERFORMANCE 4

Includes spacecraft thermal and environmental control; and attitude control.

For life support systems see *54 Man/System Technology and Life Support*. For related information see also *05 Aircraft Design, Testing and Performance* and *39 Structural Mechanics*.

19 SPACECRAFT INSTRUMENTATION N.A.

For related information see also *06 Aircraft Instrumentation* and *35 Instrumentation and Photography*.

20 SPACECRAFT PROPULSION AND POWER 5

Includes main propulsion systems and components, e.g., rocket engines; and spacecraft auxiliary power sources.

For related information see also *07 Aircraft Propulsion and Power*, *28 Propellants and Fuels*, and *44 Energy Production and Conversion*.

CHEMISTRY AND MATERIALS

Includes chemistry and materials (general); composite materials; inorganic and physical chemistry; metallic materials; nonmetallic materials; and propellants and fuels.

23 CHEMISTRY AND MATERIALS (GENERAL) 5

Includes biochemistry and organic chemistry.

24 COMPOSITE MATERIALS 6

Includes laminates.

25 INORGANIC AND PHYSICAL CHEMISTRY 7

Includes chemical analysis, e.g., chromatography; combustion theory; electrochemistry; and photochemistry.

For related information see also 77 *Thermodynamics and Statistical Physics*.

26 METALLIC MATERIALS 8

Includes physical, chemical, and mechanical properties of metals, e.g., corrosion; and metallurgy.

27 NONMETALLIC MATERIALS 8

Includes physical, chemical, and mechanical properties of plastics, elastomers, lubricants, polymers, textiles, adhesives, and ceramic materials.

28 PROPELLANTS AND FUELS N.A.

Includes rocket propellants, igniters, and oxidizers; storage and handling; and aircraft fuels.

For related information see also 07 *Aircraft Propulsion and Power*, 20 *Spacecraft Propulsion and Power*, and 44 *Energy Production and Conversion*.

ENGINEERING

Includes engineering (general); communications; electronics and electrical engineering; fluid mechanics and heat transfer; instrumentation and photography; lasers and masers; mechanical engineering; quality assurance and reliability; and structural mechanics.

For related information see also *Physics*.

31 ENGINEERING (GENERAL) N.A.

Includes vacuum technology; control engineering; display engineering; and cryogenics.

32 COMMUNICATIONS N.A.

Includes land and global communications; communications theory; and optical communications.

For related information see also 04 *Aircraft Communications and Navigation* and 17 *Spacecraft Communications, Command and Tracking*.

33 ELECTRONICS AND ELECTRICAL ENGINEERING 11

Includes test equipment and maintainability; components, e.g., tunnel diodes and transistors; micro-miniaturization; and integrated circuitry.

For related information see also 60 *Computer Operations and Hardware* and 76 *Solid-State Physics*.

34 FLUID MECHANICS AND HEAT TRANSFER 14

Includes boundary layers; hydrodynamics; fluidics; mass transfer; and ablation cooling.

For related information see also 02 *Aerodynamics* and 77 *Thermodynamics and Statistical Physics*.

35 INSTRUMENTATION AND PHOTOGRAPHY 15

Includes remote sensors; measuring instruments and gages; detectors; cameras and photographic supplies; and holography.

For aerial photography see 43 *Earth Resources*. For related information see also 06 *Aircraft Instrumentation* and 19 *Spacecraft Instrumentation*.

36 LASERS AND MASERS 18

Includes parametric amplifiers.

37 MECHANICAL ENGINEERING 20

Includes auxiliary systems (non-power); machine elements and processes; and mechanical equipment.

38 QUALITY ASSURANCE AND RELIABILITY N.A.

Includes product sampling procedures and techniques; and quality control.

39 STRUCTURAL MECHANICS N.A.

Includes structural element design and weight analysis; fatigue; and thermal stress.

For applications see 05 *Aircraft Design, Testing and Performance* and 18 *Spacecraft Design, Testing and Performance*.

GEOSCIENCES

Includes geosciences (general); earth resources; energy production and conversion; environment pollution; geophysics; meteorology and climatology; and oceanography.

For related information see also *Space Sciences*.

42 GEOSCIENCES (GENERAL) N.A.

43 EARTH RESOURCES N.A.

Includes remote sensing of earth resources by aircraft and spacecraft; photogrammetry; and aerial photography.

For instrumentation see 35 *Instrumentation and Photography*.

44 ENERGY PRODUCTION AND CONVERSION 23

Includes specific energy conversion systems, e.g., fuel cells and batteries; global sources of energy; fossil fuels; geophysical conversion; hydroelectric power; and wind power.

For related information see also 07 *Aircraft Propulsion and Power*, 20 *Spacecraft Propulsion and Power*, 28 *Propellants and Fuels*, and 85 *Urban Technology and Transportation*.

45 ENVIRONMENT POLLUTION 24

Includes air, noise, thermal and water pollution; environment monitoring; and contamination control.

46 GEOPHYSICS N.A.

Includes aeronomy; upper and lower atmosphere studies; ionospheric and magnetospheric physics; and geomagnetism.

For space radiation see 93 *Space Radiation*.

47 METEOROLOGY AND CLIMATOLOGY N.A.

Includes weather forecasting and modification.

48 OCEANOGRAPHY N.A.

Includes biological, dynamic and physical oceanography; and marine resources.

LIFE SCIENCES

Includes sciences (general); aerospace medicine; behavioral sciences; man/system technology and life support; and planetary biology.

51 LIFE SCIENCES (GENERAL) N.A.
Includes genetics.

52 AEROSPACE MEDICINE 25
Includes physiological factors; biological effects of radiation; and weightlessness.

53 BEHAVIORAL SCIENCES N.A.
Includes psychological factors; individual and group behavior; crew training and evaluation; and psychiatric research.

54 MAN/SYSTEM TECHNOLOGY AND LIFE SUPPORT 25
Includes human engineering; biotechnology; and space suits and protective clothing.

55 PLANETARY BIOLOGY N.A.
Includes exobiology; and extraterrestrial life.

MATHEMATICAL AND COMPUTER SCIENCES

Includes mathematical and computer sciences (general); computer operations and hardware; computer programming and software; computer systems; cybernetics; numerical analysis; statistics and probability; systems analysis; and theoretical mathematics.

59 MATHEMATICAL AND COMPUTER SCIENCES (GENERAL) N.A.

60 COMPUTER OPERATIONS AND HARDWARE N.A.
Includes computer graphics and data processing.
For components see *33 Electronics and Electrical Engineering*.

61 COMPUTER PROGRAMMING AND SOFTWARE N.A.
Includes computer programs, routines, and algorithms.

62 COMPUTER SYSTEMS N.A.
Includes computer networks.

63 CYBERNETICS N.A.
Includes feedback and control theory.
For related information see also *54 Man/System Technology and Life Support*.

64 NUMERICAL ANALYSIS N.A.
Includes iteration, difference equations, and numerical approximation.

65 STATISTICS AND PROBABILITY N.A.
Includes data sampling and smoothing; Monte Carlo method; and stochastic processes.

66 SYSTEMS ANALYSIS N.A.
Includes mathematical modeling; network analysis; and operations research.

67 THEORETICAL MATHEMATICS N.A.
Includes topology and number theory.

PHYSICS

Includes physics (general); acoustics; atomic and molecular physics; nuclear and high-energy physics; optics; plasma physics; solid-state physics; and thermodynamics and statistical physics.
For related information see also *Engineering*.

70 PHYSICS (GENERAL) N.A.
For geophysics see *46 Geophysics*. For astrophysics see *90 Astrophysics*. For solar physics see *92 Solar Physics*.

71 ACOUSTICS 26
Includes sound generation, transmission, and attenuation.
For noise pollution see *45 Environment Pollution*.

72 ATOMIC AND MOLECULAR PHYSICS 28
Includes atomic structure and molecular spectra.

73 NUCLEAR AND HIGH-ENERGY PHYSICS 28
Includes elementary and nuclear particles; and reactor theory.
For space radiation see *93 Space Radiation*.

74 OPTICS N.A.
Includes light phenomena.

75 PLASMA PHYSICS 29
Includes magnetohydrodynamics and plasma fusion.
For ionospheric plasmas see *46 Geophysics*. For space plasmas see *90 Astrophysics*.

76 SOLID-STATE PHYSICS 29
Includes superconductivity.
For related information see also *33 Electronics and Electrical Engineering* and *36 Lasers and Masers*.

77 THERMODYNAMICS AND STATISTICAL PHYSICS N.A.
Includes quantum mechanics; and Bose and Fermi statistics.
For related information see also *25 Inorganic and Physical Chemistry* and *34 Fluid Mechanics and Heat Transfer*.

SOCIAL SCIENCES

Includes social sciences (general); administration and management; documentation and information science; economics and cost analysis; law and political science; and urban technology and transportation.

80 SOCIAL SCIENCES (GENERAL) N.A.
Includes educational matters.

81 ADMINISTRATION AND MANAGEMENT N.A.
Includes management planning and research.

82 DOCUMENTATION AND INFORMATION SCIENCE **N.A.**

Includes information storage and retrieval technology; micrography; and library science.

For computer documentation see *61 Computer Programming and Software*.

83 ECONOMICS AND COST ANALYSIS **N.A.**

Includes cost effectiveness studies.

84 LAW AND POLITICAL SCIENCE **N.A.**

Includes space law; international law; international cooperation; and patent policy.

85 URBAN TECHNOLOGY AND TRANSPORTATION **N.A.**

Includes applications of space technology to urban problems; technology transfer; technology assessment; and surface and mass transportation.

For related information see *03 Air Transportation and Safety*, *16 Space Transportation*, and *44 Energy Production and Conversion*.

SPACE SCIENCES

Includes space sciences (general); astronomy; astrophysics; lunar and planetary exploration; solar physics; and space radiation.

For related information see also *Geosciences*.

88 SPACE SCIENCES (GENERAL) **N.A.**

89 ASTRONOMY **30**

Includes radio and gamma-ray astronomy; celestial mechanics; and astrometry.

90 ASTROPHYSICS **N.A.**

Includes cosmology; and interstellar and interplanetary gases and dust.

91 LUNAR AND PLANETARY EXPLORATION **N.A.**

Includes planetology; and manned and unmanned flights.

For spacecraft design see *18 Spacecraft Design, Testing and Performance*. For space stations see *15 Launch Vehicles and Space Vehicles*.

92 SOLAR PHYSICS **N.A.**

Includes solar activity, solar flares, solar radiation and sunspots.

93 SPACE RADIATION **N.A.**

Includes cosmic radiation; and inner and outer earth's radiation belts.

For biological effects of radiation see *52 Aerospace Medicine*. For theory see *73 Nuclear and High-Energy Physics*.

GENERAL

99 GENERAL **N.A.**

Note: N.A. means that no abstracts were assigned to this category for this issue.

Section 2 • Indexes

SUBJECT INDEX
INVENTOR INDEX
SOURCE INDEX
NUMBER INDEX
ACCESSION NUMBER INDEX



JULY 1984 (Supplement 25)

NASA Patent Abstracts Bibliography

A Semiannual Publication of the National Aeronautics and Space Administration

02

AERODYNAMICS

Includes aerodynamics of bodies, combinations, wings, rotors, and control surfaces; and internal flow in ducts and turbomachinery.

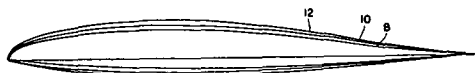
N84-11136* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

FAMILY OF AIRFOIL SHAPES FOR ROTATING BLADES Patent

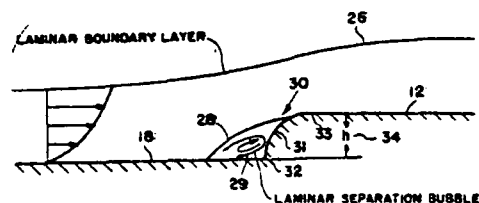
K. W. NOONAN, inventor (to NASA) 1 Nov. 1983 9 p Filed 25 Jun. 1982 Supersedes N82-33372 (20 - 24, p 3389) (NASA-CASE-LAR-12843-1; US-PATENT-4,412,664; US-PATENT-APPL-SN-392096; US-PATENT-CLASS-244-35R; US-PATENT-CLASS-244-35A; US-PATENT-CLASS-416-223R; US-PATENT-CLASS-416-242) Avail: US Patent and Trademark Office CSCL 01A

An airfoil which has particular application to the blade or blades of rotor aircraft such as helicopters and aircraft propellers is described. The airfoil thickness distribution and camber are shaped to maintain a near zero pitching moment coefficient over a wide range of lift coefficients and provide a zero pitching moment coefficient at section Mach numbers near 0.80 and to increase the drag divergence Mach number resulting in superior aircraft performance.

Official Gazette of the U.S. Patent and Trademark Office



are generally of two types: steps away from the centerline of the airfoil with a sloping surface directed toward the trailing edge and, the other design has a gap before the sloping surface. By properly shaping the step, the critical step height is increased by more than 50% over the orthogonal edged step. NASA



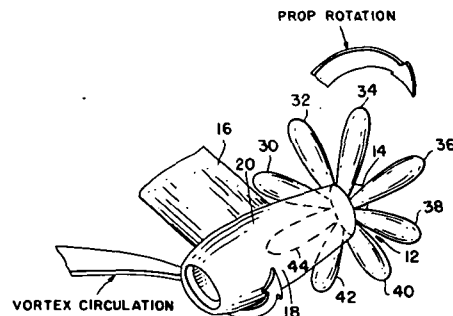
N84-20495*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

WINGTIP VORTEX PROPELLER Patent Application

J. C. PATTERSON, JR., inventor (to NASA) 2 Feb. 1984 16 p (NASA-CASE-LAR-13019-1; US-PATENT-APPL-SN-576308) Avail: NTIS HC A02/MF A01 CSCL 01A

A device which increases the energy efficiency and aerodynamic properties of aircraft was developed. A wingtip pusher propeller is positioned aft of the wingtip to rotate in the crossflow of the wingtip vortex. The propeller rotates against the vortex swirl creating additional thrust from and attenuating the wingtip vortex by simultaneously extracting energy from the vortex and converting it to propeller blade-induced thrust. The propeller injects its high energy wake into the vortex axial flow to dissipate the vortex. The device increases aircraft fuel efficiency by simultaneously increasing thrust and decreasing vortex induced drag. By attenuating the vortex, safety to following aircraft is maximized.

NASA



N84-12092*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

GEOMETRIES FOR ROUGHNESS SHAPES IN LAMINAR FLOW Patent Application

B. J. HOLMES, G. L. MARTIN (Kentron Intern., Hampton, Va.), C. S. DOMACK (Kentron Intern., Hampton, Va.), C. J. OBARA (Kentron Intern., Hampton, Va.), and A. A. HASSAN, inventors (to NASA) (Arizona State Univ., Tempe) 10 Nov. 1983 18 p (NASA-CASE-LAR-13255-1; US-PATENT-APPL-SN-550681) Avail: NTIS HC A02/MF A01 CSCL 01A

A passive interface mechanism between upper and lower skin structures, and a leading edge structure of a laminar flow airfoil is described. The interface mechanism takes many shapes. All are designed to be different than the sharp orthogonal arrangement prevalent in the prior art. The shapes of the interface structures

04 AIRCRAFT COMMUNICATIONS AND NAVIGATION

04

AIRCRAFT COMMUNICATIONS AND NAVIGATION

Includes digital and voice communication with aircraft; air navigation systems (satellite and ground based); and air traffic control.

N84-12151*# National Aeronautics and Space Administration. Pasadena Office, Calif.

HIGH DYNAMIC GLOBAL POSITIONING SYSTEM RECEIVER Patent Application

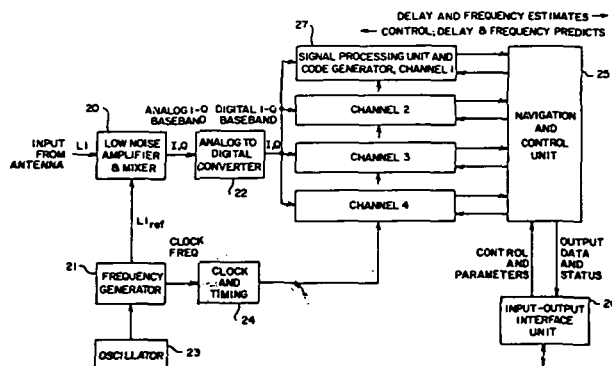
W. J. HURD, inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) 31 Oct. 1983 31 p

(Contract NAS7-100)

(NASA-CASE-NPO-16171-1-CU; US-PATENT-APPL-SN-551536)

Avail: NTIS HC A03/MF A01 CSCL 17G

A Global Positioning System (GPS) receiver having a number of channels, receives an aggregate of pseudorange code time division modulated signals. The aggregate is converted to baseband and then to digital form for separate processing in the separate channels. A fast Fourier transform processor computes the signal energy as a function of Doppler frequency for each correlation lag, and a range and frequency estimator computes estimates of pseudorange, and frequency. Raw estimates from all channels are used to estimate receiver position, velocity, clock offset and clock rate offset in a conventional navigation and control unit, and based on the total solution, that unit computes smoothed estimates, for the next measurement interval. NASA



N84-14132* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

MAGNETIC HEADING REFERENCE Patent

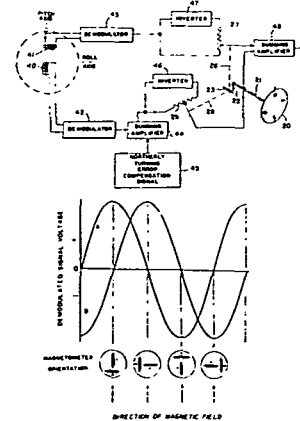
H. D. GARNER, inventor (to NASA) 6 Dec. 1983 16 p Filed 9 Apr. 1982 Supersedes N82-26260 and N82-24726 (20 - 17, p 2351) (20 - 15, p 2122)

(NASA-CASE-LAR-12638-1; US-PATENT-4,418,480; US-PATENT-APPL-SN-367187; US-PATENT-CLASS-33-348; US-PATENT-CLASS-33-356; US-PATENT-CLASS-33-361; US-PATENT-CLASS-33/DIG.3) Avail: US Patent and Trademark Office CSCL 17G

Devices are disclosed for vectorially summing two signals. In a first embodiment, the vectorial summation is implemented by a mechanical sin/cos mechanism in which a crank drives two linear potentiometers out of phase. In a second embodiment, a polarized light resolver generates the sin and cos functions. In a third embodiment, a printed circuit resolver generates the sin and cos

functions.

Official Gazette of the U.S. Patent and Trademark Office



05

AIRCRAFT DESIGN, TESTING AND PERFORMANCE

Includes aircraft simulation technology.

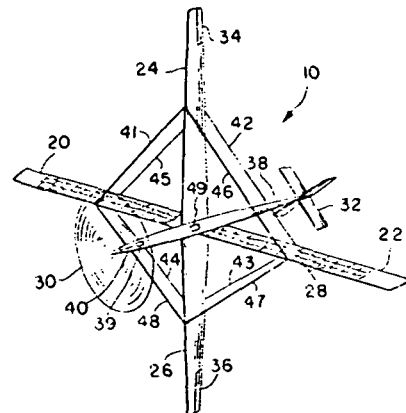
N84-12154* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

SOLAR POWERED AIRCRAFT Patent

W. H. PHILLIPS, inventor (to NASA) 15 Nov. 1983 5 p Filed 15 May 1981 Supersedes N81-32138 (19 - 23, p 3148)

(NASA-CASE-LAR-12615-1; US-PATENT-4,415,133; US-PATENT-APPL-SN-263829; US-PATENT-CLASS-244-53R; US-PATENT-CLASS-244-13; US-PATENT-CLASS-244-45R; US-PATENT-CLASS-244-91; US-PATENT-CLASS-244-55) Avail: US Patent and Trademark Office CSCL 01C

A cruciform wing structure for a solar powered aircraft is disclosed. Solar cells are mounted on horizontal wing surfaces. Wing surfaces with spanwise axis perpendicular to surfaces maintain these surfaces normal to the Sun's rays by allowing aircraft to be flown in a controlled pattern at a large bank angle. The solar airplane may be of conventional design with respect to fuselage, propeller and tail, or may be constructed around a core and driven by propeller mechanisms attached near the tips of the airfoils. Official Gazette of the U.S. Patent and Trademark Office



06

AIRCRAFT INSTRUMENTATION

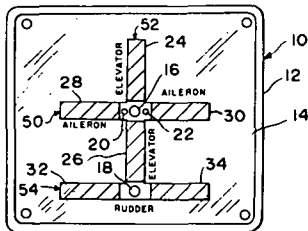
Includes cockpit and cabin display devices; and flight instruments.

N84-20522*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

AIRCRAFT CONTROL POSITION INDICATOR Patent Application

D. V. DENNIS, inventor (to NASA) 8 Feb. 1984 15 p
(NASA-CASE-LAR-12984-1; US-PATENT-APPL-SN-578387)
Avail: NTIS HC A02/MF A01 CSCL 01D

An aircraft control position indicator was provided that displayed the degree of deflection of the primary flight control surfaces and the manner in which the aircraft responded. The display included a vertical elevator dot/bar graph meter display for indicating whether the aircraft will pitch up or down, a horizontal aileron dot/bar graph meter display for indicating whether the aircraft will roll to the left or the right, and a horizontal rudder dot/bar graph meter display for indicating whether the aircraft will turn left or right. The vertical and horizontal display or displays intersect to form an up/down, left/right type display. Internal electronic display driver means received signals from transducers measuring the control surface deflections and determined the position of the meter indicators on each dot/bar graph meter display. The device allows readability at a glance, easy visual perception in sunlight or shade, near-zero lag in displaying flight control position, and is not affected by gravitational or centrifugal forces. NASA



09

RESEARCH AND SUPPORT FACILITIES (AIR)

Includes airports, hangars and runways; aircraft repair and overhaul facilities; wind tunnels; shock tube facilities; and engine test blocks.

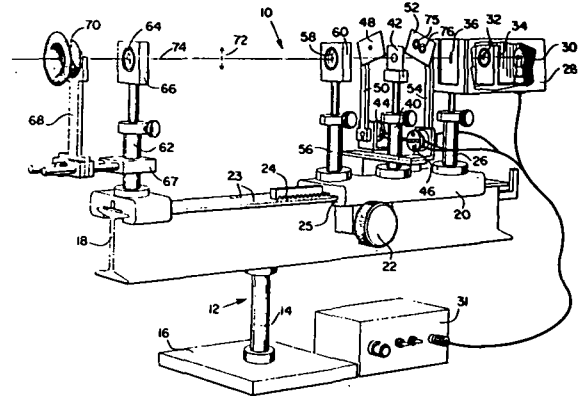
N84-12193*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

VISUAL ACCOMMODATION TRAINER-TESTER Patent Application

R. J. RANDLE, JR., inventor (to NASA) 12 Aug. 1983 20 p
(NASA-CASE-ARC-11426-1; US-PATENT-APPL-SN-526741)
Avail: NTIS HC A02/MF A01 CSCL 14B

An apparatus for training of the human visual accommodation system is presented, specifically, useful for training a person to volitionally control his focus to his far point (normally infinity) from a position of myopia due to functional causes. The functional causes could be due, for example, to a behavioral accommodative spasm or the effects of an empty field. The device may also be

used to measure accommodation, the accommodation resting position and the near and far points of vision. NASA

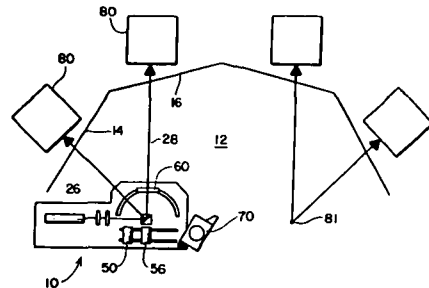


N84-16221*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

SIMULATOR SCENE DISPLAY EVALUATION Patent Application

R. F. HAINES, inventor (to NASA) 22 Dec. 1983 15 p
(NASA-CASE-ARC-11504-1; US-PATENT-APPL-SN-565481)
Avail: NTIS HC A02/MF A01 CSCL 14B

An apparatus for aligning and calibrating scene displays in an aircraft simulator has a base on which all of the instruments for the aligning and calibrating are mounted. Laser directs beam at double right prism which is attached to pivoting support on base. The pivot point of the prism is located at the design eye point (DEP) of simulator during the aligning and calibrating. The objective lens in the base is movable on a track to follow the laser beam at different angles within the field of vision at the DEP. An eyepiece and a precision diopter are movable into a position behind the prism during the scene evaluation. A photometer or illuminometer is pivotable about the pivot into and out of position behind the eyepiece. NASA



15

LAUNCH VEHICLES AND SPACE VEHICLES

Includes boosters; manned orbital laboratories; reusable vehicles; and space stations.

N84-16231* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

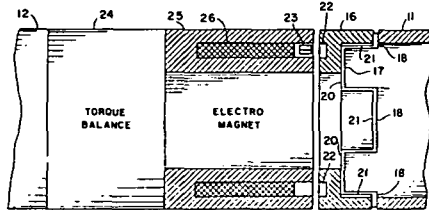
MISSILE ROLLING TAIL BRAKE TORQUE SYSTEM Patent

18 SPACECRAFT DESIGN, TESTING AND PERFORMANCE

W. T. DAVIS, inventor (to NASA) 17 Jan. 1984 6 p Filed 11 Jan. 1982 Supersedes N82-26675 (20 - 17, p 2411)
(NASA-CASE-LAR-12751-1; US-PATENT-4,425,785;
US-PATENT-APPL-SN-338386; US-PATENT-CLASS-73-9;
US-PATENT-CLASS-73-167; US-PATENT-CLASS-73-432R)
Avail: US Patent and Trademark Office CSCL 22B

Apparatus for simulating varying levels of friction in the bearings of a free rolling tail afterbody on a canard-controlled missile to determine friction effects on aerodynamic control characteristics is described. A ring located between the missile body and the afterbody is utilized in a servo system to create varying levels of friction between the missile body and the afterbody to simulate bearing friction.

Official Gazette of the U.S. Patent and Trademark Office



18

SPACECRAFT DESIGN, TESTING AND PERFORMANCE

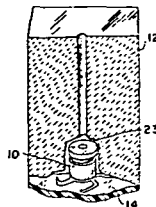
Includes spacecraft thermal and environmental control; and attitude control.

N84-15180*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

MECHANICAL FASTENER Patent Application

A. B. STACY, JR., inventor (to NASA) 7 Oct. 1983 11 p
(NASA-CASE-LAR-12738-2; US-PATENT-APPL-SN-539230)
Avail: NTIS HC A02/MF A01 CSCL 22B

A device for fastening a temporary replacement heat shield tile to the strain isolation pad of a space vehicle is disclosed. An internally threaded, flanged cylinder is rotatably connected to a threaded brass plug through a flanged aluminum sleeve to form the device. The device is adhesively attached to the replacement tile before using. In using the device, the tile containing the device is placed against the strain isolation pad of the space vehicle such that the flanged portion of the flanged cylinder rests against the strain isolation pad. This flanged portion, which consists of a plurality of 'L' shaped blades, is then rotated into the strain isolation pad. The brass plug is then rotated with respect to the flanged stainless steel cylinder to draw the tile snugly against the strain isolation pad and thus complete the fastening process. NASA

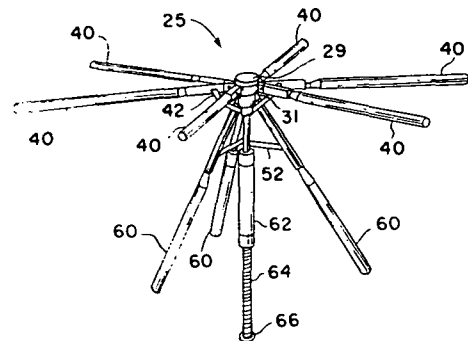


N84-16250*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

SYNCHRONOUSLY DEPLOYABLE TRUSS STRUCTURE Patent Application

H. G. BUSH, M. M. MIKULAS, JR., and R. E. WALLSOM, inventors (to NASA) (Kentron International, Inc., Hampton, Va.) 30 Nov. 1983 15 p
(NASA-CASE-LAR-13117-1; US-PATENT-APPL-SN-556512)
Avail: NTIS HC A02/MF A01 CSCL 22B

A collapsible-expandable truss structure is disclosed which includes two space surface truss layers with an attached core layer. The surface truss layers are composed of several linear struts arranged in multiple triangular configurations. Each linear strut is hinged at its center and hingedly connected at each end to a nodular joint. A passive spring serves as the expansion force to move the folded struts from a stowed collapsed position to a deployed operative final truss configuration. A damper controls the rate of spring expansion for synchronized deployment of the truss as the folded configuration is released for deployment by restraint belts that synchronously extend under the control of motor driven spools. NASA

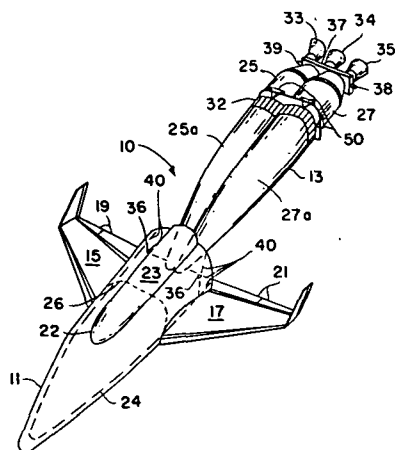


N84-20628*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

AEROSPACE VEHICLE Patent Application

L. R. JACKSON and A. H. TAYLOR, inventors (to NASA) 9 Jan. 1984 17 p
(NASA-CASE-LAR-13155-1; US-PATENT-APPL-SN-569371)
Avail: NTIS HC A02/MF A01 CSCL 22B

A dual structure aerospace vehicle has an aeroshell structure and an internally disposed separable and reusable integral tank/thrust structure. The tank/thrust structure is insulated for cryogenic fuels and the cavity within aeroshell is insulated from the tank/thrust structure. An internal support ring within the cavity serves as an attachment for lugs on the tank/thrust structure via double hinges. The aft end of tank/thrust structure is provided



20

Includes main propulsion systems and components, e.g., rocket engines; and spacecraft auxiliary power sources.

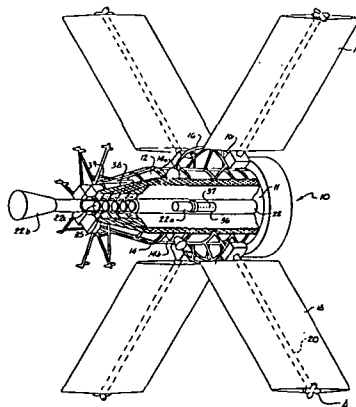
N84-15183*# National Aeronautics and Space Administration.
Marshall Space Flight Center, Huntsville, Ala.

PROPULSION APPARATUS AND METHOD USING BOIL-OFF GAS FROM A CRYOGENIC LIQUID Patent Application

D. H. BLOUNT, inventor (to NASA) 14 Dec. 1983 12 p
(NASA-CASE-MFS-25946-1; US-PATENT-APPL-SN-561432)
Avail: NTIS HC A02/MF A01 CSCL 21H

The attitude and drag of a space vehicle are controlled by using the helium dewar which contains liquid helium for cooling an experiment package. The helium is heated or vented to keep the temperature between 1.5 and 1.7 degrees K to maintain helium boil-off gas adequate as a propellant without adversely affecting the experiment package which is contained in the helium dewar for protection from solar heating. The apparatus includes an auxiliary heater and a sensor for controlling the temperature of the helium. The boil-off gas propellant is delivered to thruster modules to control vehicle attitude and compensate for drag.

NASA



23

Includes biochemistry and organic chemistry.

N84-16255* National Aeronautics and Space Administration.
Pasadena Office, Calif.

SUPERCRITICAL MULTICOMPONENT SOLVENT COAL
EXTRACTION Patent

W. H. CORCORAN (JPL, California Inst. of Tech., Pasadena), W. S. FONG (JPL, California Inst. of Tech., Pasadena), P. PICHAICHANARONG (JPL, California Inst. of Tech., Pasadena), P. C. F. CHAN (JPL, California Inst. of Tech., Pasadena), and D. D. LAWSON, inventors (to NASA) (JPL, California Inst. of Tech., Pasadena) 14 Jun. 1983 12 p Filed 30 Oct. 1981 Supersedes N82-12241 (20 - 03, p 0318)

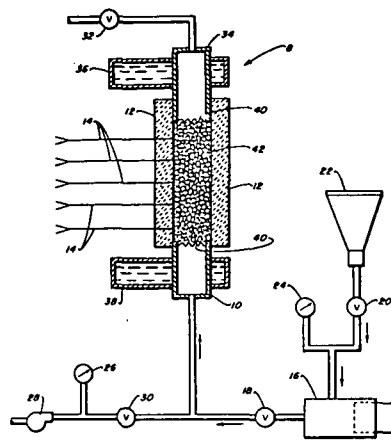
(NASA-CASE-NPO-15767-1; US-PATENT-4,388,171:

US-PATENT-APPL-SN-315584; US-PATENT-CLASS-208-8LE:

US-PATENT-CLASS-208-10) Avail: US Patent and Trademark Office CSCJ 07D

The yield of organic extract from the supercritical extraction of coal with larger diameter organic solvents such as toluene is increased by use of a minor amount of from 0.1 to 10% by weight of a second solvent such as methanol having a molecular diameter significantly smaller than the average pore diameter of the coal.

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N84-16259*# National Aeronautics and Space Administration.
Ames Research Center, Moffett Field, Calif.

PROCESS FOR PREPARING PHTHALOCYANINE POLYMERS
Patent Application

B. N. ACHAR (NAS-NRC, Washington, D.C.), G. M. FOHLEN, and
J. A. PARKER, inventors (to NASA) 22 Dec. 1983 18 p
(NASA-CASE-ARC-11511-1; US-PATENT-APPL-SN-565482)

Avail: NTIS HC A02/MF A01 CSQL 07A

Imide linked bisphthalonitrile compounds are prepared by combining a dicyano aromatic diamine and an organic dianhydride to produce an amic acid linked bisphthalonitrile compound. The amic acid linked bisphthalonitrile compound is dehydrocyclized to produce the imide linked bisphthalonitrile compounds. The imide linked bisphthalonitrile compounds are polymerized to produce a phthalocyanine polymer by heating the imide linked bisphthalonitrile compound, either alone or in the presence of a metal powder or a metal salt.

NASA

NASA

24 COMPOSITE MATERIALS

24

COMPOSITE MATERIALS

Includes laminates.

N84-11213* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

FLUOROETHER MODIFIED EPOXY COMPOSITES Patent

R. W. ROSSER (San Jose State Univ.) and M. S. TAYLOR, inventors (to NASA) (San Jose State Univ.) 18 Oct. 1983 5 p Filed 23 Dec. 1982 Supersedes N83-17603 (21 - 08, p 1145) Sponsored by NASA

(NASA-CASE-ARC-11418-1; US-PATENT-4,410,682; US-PATENT-APPL-SN-452464; US-PATENT-CLASS-528-110; US-PATENT-CLASS-523-435; US-PATENT-CLASS-523-456; US-PATENT-CLASS-528-361) Avail: US Patent and Trademark Office CSCL 11D

Addition of controlled amounts of perfluorinated alkyl ether diacyl fluoride to epoxy resin systems prior to cure results in a formulation which, exhibits improved energy absorbing properties.

Official Gazette of the U.S. Patent and Trademark Office

N84-11214* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

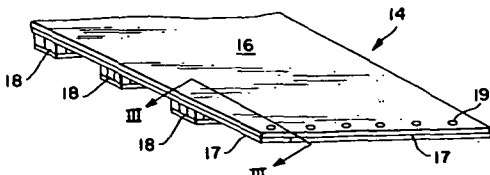
METAL MATRIX COMPOSITE STRUCTURAL PANEL CONSTRUCTION Patent

R. R. MCWITHEY, D. M. ROYSTER, inventors (to NASA), and T. T. BALES 25 Oct. 1983 8 p Filed 30 Jun. 1981

(NASA-CASE-LAR-12807-1; US-PATENT-4,411,380; US-PATENT-APPL-SN-280155; US-PATENT-CLASS-228-181; US-PATENT-CLASS-52-806; US-PATENT-CLASS-52-808; US-PATENT-CLASS-228-157; US-PATENT-CLASS-228-212; US-PATENT-CLASS-244-119; US-PATENT-CLASS-244-123; US-PATENT-CLASS-428-593) Avail: US Patent and Trademark Office CSCL 11D

Lightweight capped honeycomb stiffeners for use in fabricating metal or metal/matrix exterior structural panels on aerospace type vehicles and the process for fabricating same are disclosed. The stiffener stringers are formed in sheets, cut to the desired width and length and brazed in spaced relationship to a skin with the honeycomb material serving directly as the required lightweight stiffeners and not requiring separate metal encasement for the exposed honeycomb cells.

Official Gazette of the U.S. Patent and Trademark Office



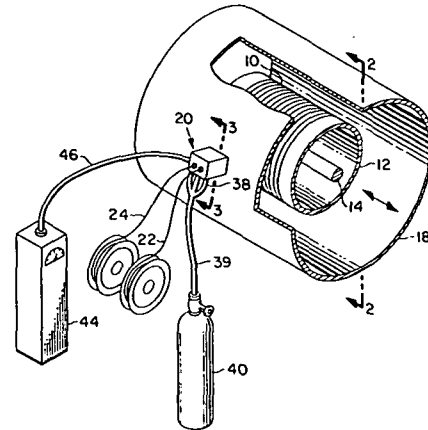
N84-15203*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

ARC SPRAY FABRICATION OF METAL MATRIX COMPOSITE MONOTAPE Patent Application

L. J. WESTFALL, inventor (to NASA) 9 Dec. 1983 12 p (NASA-CASE-LEW-13828-1; US-PATENT-APPL-SN-560035) Avail: NTIS HC A02/MF A01 CSCL 11D

Arc metal spraying is used to spray liquid metal onto an array of high strength fibers that have been previously wound onto a

large drum contained inside a controlled atmosphere chamber. This chamber is first evacuated to remove gaseous contaminants and then backfilled with a neutral gas up to atmospheric pressure. This process is used to produce a large size metal matrix composite monotape. NASA



N84-16262* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

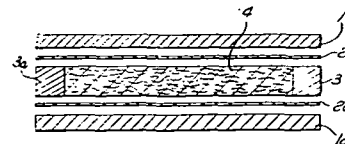
METHOD AND TECHNIQUE FOR INSTALLING LIGHT-WEIGHT, FRAGILE, HIGH-TEMPERATURE FIBER INSULATION Patent

B. C. PATEL, inventor (to NASA) (Rockwell International Corp., Downey, Calif.) 20 Dec. 1983 4 p Filed 25 Mar. 1982 Continuation of abandoned US Patent Appl. SN-185868, filed 11 Sep. 1980 and abandoned US Patent Appl. SN-969757, filed 15 Dec. 1979 Sponsored by NASA

(NASA-CASE-MSC-16934-3; US-PATENT-4,421,700; US-PATENT-APPL-SN-361711; US-PATENT-APPL-SN-185868; US-PATENT-APPL-SN-969757; US-PATENT-CLASS-264-59; US-PATENT-CLASS-264-60; US-PATENT-CLASS-264-118; US-PATENT-CLASS-164-119) Avail: US Patent and Trademark Office CSCL 11D

A method of installing fragile, light weight, high temperature fiber insulation, particularly where the insulation is to be used as a seal strip providing a high order of thermal barrier insulation is discussed. The process is based on provision of a strip of the mineral batting cut oversize by a predetermined amount, saturated in a fugitive polymer solution, compressed in a mold, dried and cured to form a rigidized batting material which is machined to required shape. The machine dimensions would normally be at least nominally less than the dimensions of the cavity to be sealed. After insertion in the cavity, which may be a wire-mesh seal enclosure, the apparatus is subjected to baking at a temperature sufficiently high to cause the resin to burn off cleanly, leaving the batting substantially in its original condition and expanded into the cavity or seal enclosure.

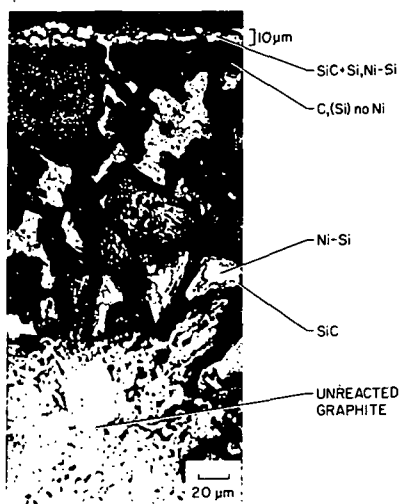
Official Gazette of the U.S. Patent and Trademark Office



25 INORGANIC AND PHYSICAL CHEMISTRY

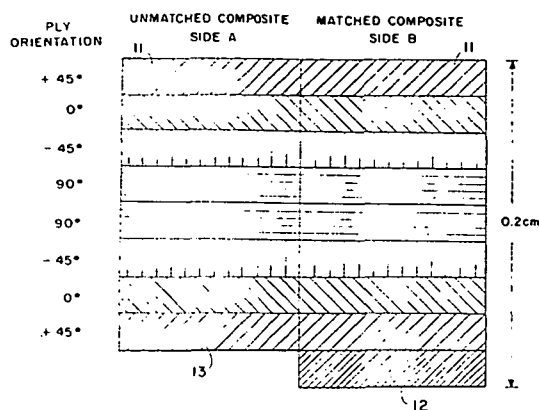
N84-16266*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
OXIDATION RESISTANT SLURRY COATING FOR CARBON-BASED MATERIALS Patent Application
 J. L. SMIALEK and G. RYBICKI, inventors (to NASA) 17 Jan. 1984 10 p
 (NASA-CASE-LEW-13923-1; US-PATENT-APPL-SN-571617)
 Avail: NTIS HC A02/MF A01 CSCL 11D

An oxidation resistant coating is produced on carbon-based materials, and the same processing step effects an infiltration of the substrate with silicon containing material. A slurry of nickel and silicon powders in a nitrocellulose lacquer is made, is sprayed onto the graphite or carbon-carbon substrate, and is sintered in vacuum to form a fused coating that wets and covers the surface as well as penetrates into the pores of the substrate. Optimum wetting and infiltration occurs in the range of Ni-60 w/o Si to Ni-90 w/o Si with deposited thicknesses of 25 to 100 mg/sq cm. Sintering temperatures of about 1200 C to about 1400 C are used, depending, on the melting point of the specific coating composition. The sintered coating results in Ni-Si intermetallic phases and SiC, both of which are highly oxidation resistant. The final coating composition can be further controlled by the length of the sintering time. NASA



that efficiently couples the acoustic energy out of the material.

NASA



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INORGANIC AND PHYSICAL CHEMISTRY

Includes chemical analysis, e.g., chromatography; combustion theory; electrochemistry; and photochemistry.

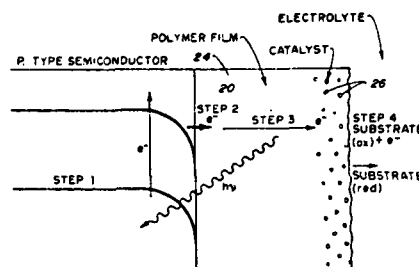
N84-12262* National Aeronautics and Space Administration. Pasadena Office, Calif.

PHOTOELECTROCHEMICAL ELECTRODES Patent

R. M. WILLIAMS (JPL, California Inst. of Tech., Pasadena) and A. REMBAUM, inventors (to NASA) (JPL, California Inst. of Tech., Pasadena) 8 Nov. 1983 13 p Filed 10 May 1982 Supersedes N83-25587 (21 - 14, p 2327) Sponsored by NASA
 (NASA-CASE-NPO-15458-1; US-PATENT-4,414,080; US-PATENT-APPL-SN-376306; US-PATENT-CLASS-204-129; US-PATENT-CLASS-204-242; US-PATENT-CLASS-204-278; US-PATENT-CLASS-204-290R; US-PATENT-CLASS-204-DIG.3; US-PATENT-CLASS-427-443.2; US-PATENT-CLASS-429-111)
 Avail: US Patent and Trademark Office CSCL 07D

The surface of a moderate band gap semiconductor such as p-type molybdenum sulfide is modified to contain an adherent film of charge mediating ionene polymer containing an electroactive unit such as bipyridinium. Electron transport between the electrode and the mediator film is favorable and photocorrosion and recombination processes are suppressed. Incorporation of particles of catalyst such as platinum within the film provides a reduction in overvoltage. The polymer film is readily deposited on the electrode surface and can be rendered stable by ionic or addition crosslinking. Catalyst can be predispersed in the polymer film or a salt can be impregnated into the film and reduced therein.

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N84-20649*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
IMPROVED IMPACT TOLERANT MATERIAL
 J. S. HEYMAN, inventor (to NASA) 22 Feb. 1984 12 p
 (NASA-CASE-LAR-12887-1; US-PATENT-APPL-SN-582493)
 Avail: NTIS HC A02/MF A01 CSCL 11D

A material design is proposed whereby the material is protected from acoustic shock waves generated by impacting projectiles by means of a backing. The backing has an acoustic impedance

25 INORGANIC AND PHYSICAL CHEMISTRY

N84-16276* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

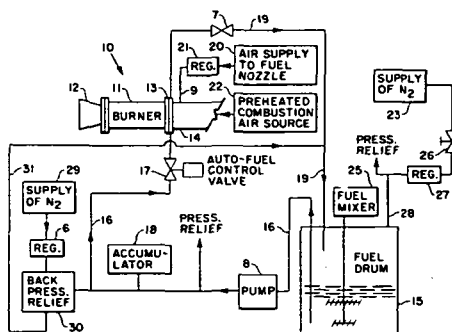
MICRONIZED COAL BURNER FACILITY Patent

F. D. CALFO and M. W. LUPTON, inventors (to NASA) 17 Jan. 1984 6 p Filed 30 Jun. 1982 Supersedes N82-31769 (20 - 22, p 3149)

(NASA-CASE-LEW-13426-1; US-PATENT-4,425,854; US-PATENT-APPL-SN-393588; US-PATENT-CLASS-110-262; US-PATENT-CLASS-110-186; US-PATENT-CLASS-110-263; US-PATENT-CLASS-110-265; US-PATENT-CLASS-431-1) Avail: US Patent and Trademark Office CSCL 21B

A combustor or burner system in which the ash resulting from burning a coal in oil mixture is of submicron particle size is described. The burner system comprises a burner section, a flame exit nozzle, a fuel nozzle section, and an air tube by which preheated air is directed into the burner section. Regulated air pressure is delivered to a fuel nozzle. Means are provided for directing a mixture of coal particles and oil from a drum to a nozzle at a desired rate and pressure while means returns excess fuel to the fuel drum. Means provide for stable fuel pressure supply from the fuel pump to the fuel nozzle.

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26

METALLIC MATERIALS

Includes physical, chemical, and mechanical properties of metals, e.g., corrosion; and metallurgy.

N84-12289* National Aeronautics and Space Administration. Pasadena Office, Calif.

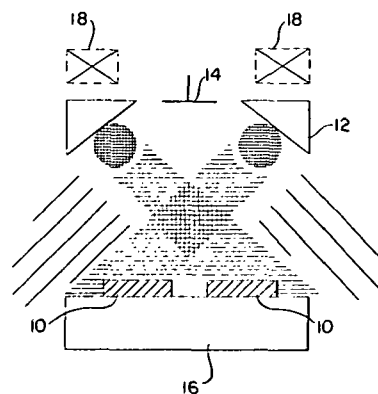
CORROSION RESISTANT COATING Patent Application

S. K. KHANNA (JPL, California Inst. of Tech., Pasadena), A. THAKOOR (JPL, California Inst. of Tech., Pasadena), and R. M. WILLIAMS, inventors (to NASA) (JPL, California Inst. of Tech., Pasadena) 30 Sep. 1983 14 p (Contract NAS7-100)

(NASA-CASE-NPO-15928-1; US-PATENT-APPL-SN-537616) Avail: NTIS HC A02/MF A01 CSCL 11F

A highly corrosive resistant coating for substrates, such as glasses and metal is provided. Amorphous metals are deposited on the substrate by the magnetron sputtering process which is conducted at a very low pressure, such as two micrometers of

mercury, to provide on the surface of the substrate a thin, uniformly thick, pinhole-free film of the metal. NASA



N84-20670* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

METHOD OF COATING A SUBSTRATE WITH A RAPIDLY SOLIDIFIED METAL Patent Application

H. P. CHU and C. L. STAUGAITIS, inventors (to NASA) 19 Mar. 1984 10 p

(NASA-CASE-GSC-12880-1; US-PATENT-APPL-SN-590925)

Avail: NTIS HC A02/MF A01 CSCL 11F

A method for coating a substrate with rapidly solidified metal is described which comprises spraying a mixture of rapidly solidified (RS) metal powder and small peening particles at high velocity against a substrate. The velocity is sufficient for the rapidly solidified metal powder and peening particles to impact the substrate and simultaneously bond the metal powder to the substrate. If the substrate is metallic, the method may provide the simultaneous mechanical working of the substrate surface. Two or more different R/S metal powders may be introduced into the peening particle stream simultaneously or alternately, or metal and nonmetal powders may be applied together in layers. NASA

27

NONMETALLIC MATERIALS

Includes physical, chemical, and mechanical properties of plastics, elastomers, lubricants, polymers, textiles, adhesives, and ceramic materials.

N84-11297* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

CRYOGENIC INSULATION STRENGTH AND BOND TESTER Patent Application

P. H. SCHUERER, J. H. EHL, and W. P. PRASTHOFER, inventors (to NASA) 3 Nov. 1983 21 p

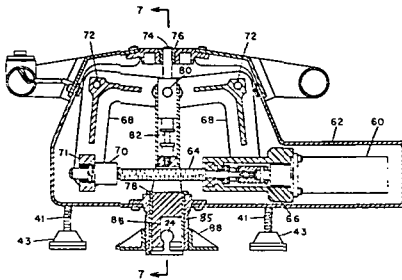
(NASA-CASE-MFS-25910-1; US-PATENT-APPL-SN-548582)

Avail: NTIS HC A02/MF A01 CSCL 11G

A method and apparatus for testing the tensile strength and bonding strength of sprayed-on foam insulation attached to metal cryogenic fuel tanks is described. A circular cutter is used to cut the insulation down to the surface of the metal tank to form plugs of the insulation for testing 'in situ' on the tank. The apparatus comprises an electromechanical pulling device powered by a belt battery pack. The pulling device comprises a motor driving a mechanical pulling structure comprising a horizontal shaft

connected to two bell cracks which are connected to a central member. When the lower end of member is attached to a fitting, which in turn is bonded to a plug, a pulling force is exerted on the plug sufficient to rupture it. The force necessary to rupture the plug or pull it loose is displayed as a digital read-out on screen.

NASA



N84-12313*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

POLYMERS OF PHOSPHONYLMETHYL-2,4- AND -2,6-DIAMINO BENZENES AND THE LIKE Patent Application

J. A. MIKROYANNIDIS (NAS-NRC, Washington, D.C.) and D. A. KOURTIDES, inventors (to NASA) 12 Aug. 1983 14 p Sponsored by NASA

(NASA-CASE-ARC-11506-1; US-PATENT-APPL-SN-522629)

Avail: NTIS HC A02/MF A01 CSCL 111

Epoxy polymers resulting from the curing of epoxy materials with diamines such as m-phenylene diamine are deficient with respect to fire and heat resistance. A phosphonyl-methylbenzene is provided and polymerized with a monomer such as an epoxide, or a dianhydride. The resulting polymers combine one or more properties of heat resistance, low flammability and high char yield with good mechanical properties such as high tensile strength.

NASA

N84-14322* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

ELASTOMER-MODIFIED PHOSPHORUS-CONTAINING IMIDE RESINS Patent

I. K. VARMA (NAS-NRC, Washington, D.C.), G. M. FOHLEN (NAS-NRC, Washington, D.C.), and J. A. PARKER, inventors (to NASA) (NAS-NRC, Washington, D.C.) 20 Dec. 1983 8 p Filed 15 Nov. 1982 Supersedes N83-14276 (21 - 05, p 0643) Sponsored by NASA

(NASA-CASE-ARC-11400-1; US-PATENT-4,421,820; US-PATENT-APPL-SN-441899; US-PATENT-CLASS-428-246; US-PATENT-CLASS-524-494; US-PATENT-CLASS-524-496; US-PATENT-CLASS-524-500; US-PATENT-CLASS-524-530; US-PATENT-CLASS-525-282; US-PATENT-CLASS-525-287; US-PATENT-CLASS-428-260; US-PATENT-CLASS-428-367; US-PATENT-CLASS-428-408; US-PATENT-CLASS-428-473.5; US-PATENT-CLASS-428-902; US-PATENT-CLASS-428-920)

Avail: US Patent and Trademark Office CSCL 11G

Phosphine oxide-containing polyimide resins modified by elastomers, are disclosed which have improved mechanical properties. These products are particularly useful in the production of fiber or fabric-reinforced composites or laminates.

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N84-14323* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

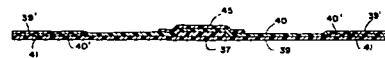
HOT MELT RECHARGE SYSTEM Patent

D. J. PROGAR, inventor (to NASA) 13 Dec. 1983 7 p Filed 24 Mar. 1982 Supersedes N82-26464 (20 - 17, p 2381)

(NASA-CASE-LAR-12881-1; US-PATENT-4,420,518; US-PATENT-APPL-SN-361215; US-PATENT-CLASS-428-40; US-PATENT-CLASS-428-78; US-PATENT-CLASS-428-202; US-PATENT-CLASS-428-347; US-PATENT-CLASS-206-447; US-PATENT-CLASS-206-582) Avail: US Patent and Trademark Office CSCL 11A

A package assembly is described for precisely positioning a charge of hot melt adhesive onto an attachment pad or point of use. The adhesive is heated to softening or melt temperature (280 F to 325 F) and thereafter cooled to resolidifying temperature. A single sided pressure sensitive polyimide film tape serves with another film strip to protect a sandwiched adhesive strip until use and to hold the adhesive in precise position until thermally bonded to its point of use. Tab ends serve as aids in stripping tapes and from the adhesive charge.

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N84-14324* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

HEAT SEALABLE, FLAME AND ABRASION RESISTANT COATED FABRIC Patent

R. P. TSCHIRCH (Little (Arthur D.), Inc., Cambridge, Mass.) and K. R. SIDMAN, inventors (to NASA) (Little, (Arthur D.), Inc., Cambridge, Mass.) 26 Jul. 1983 6 p Filed 6 Mar. 1981 Supersedes N82-24344 (20 - 15, p 2066) Division of US-Patent-App-SN-145107, US-Patent-4,284,682, filed 30 Apr. 1980 Sponsored by NASA

(NASA-CASE-MSF-18382-2; US-PATENT-4,395,511; US-PATENT-APPL-SN-241155; US-PATENT-CLASS-524-371) Avail: US Patent and Trademark Office CSCL 11G

Flame retardant, abrasion resistant elastomeric compositions are disclosed which are comprised of thermoplastic polyurethane polymer and flame retarding amounts of a filler selected from decabromodiphenyloxide and antimony oxide in a 3:1 weight ratio, and decabromodiphenyloxide, antimony oxide, and ammonium polyphosphate in a 3:1:3 weight ratio respectively. Heat sealable coated fabrics employing such elastomeric compositions as coating film are produced by dissolving the elastomeric composition to form a solution, casting the solution onto a release paper and drying it to form an elastomeric film. The film is then bonded to a woven, knitted, or felted fabric.

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N84-15271*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

HOT MELT RECHARGE SYSTEM Patent Application

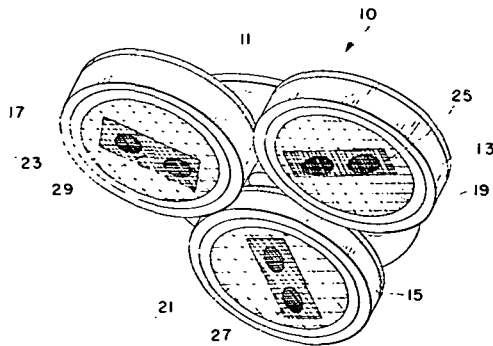
D. J. PROGAR, inventor (to NASA) 26 Aug. 1983 11 p (NASA-CASE-LAR-12881-2; US-PATENT-APPL-SN-526755)

Avail: NTIS HC A02/MF A01 CSCL 11A

A package assembly is described for precisely positioning a charge of hot melt adhesive onto an attachment pad or a point of use. The adhesive is heated to softening or melt temperature (280 F - 325 F) and thereafter cooled to resolidifying temperature. A single sided pressure sensitive polyimide film tape serves with another film strip to protect the sandwiched adhesive strip until use and to hold the adhesive in precise position until thermally

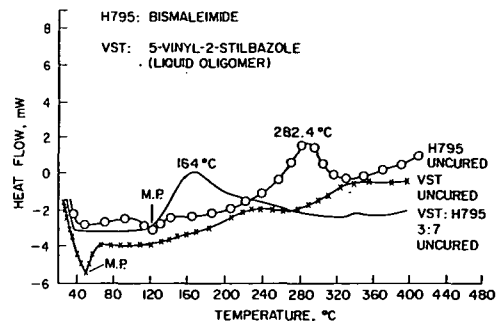
27 NONMETALLIC MATERIALS

bonded to its point of use. Tab ends serve as aids in stripping tapes from the adhesive charge. NASA



form copolymers with bismaleimides which have good fire retardancy and decreased brittleness. The cure temperatures of the copolymers are substantially below the cure temperatures of the bismaleimides alone. Reinforced composites made from the cured copolymers are disclosed as well. NASA

DSC OF BISMALEIMIDE AND VST/BISMALEIMIDE COPOLYMERS



N84-16340*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

AMINE TERMINATED BISPARTIMIDES, PROCESS FOR PREPARATION THEREOF, AND POLYMERS THEREOF Patent Application

D. KUMAR (NAS-NRC, Washington, D.C.), G. M. FOHLEN, and J. A. PARKER 15 Dec. 1983 17 p

(NASA-CASE-ARC-11421-1; US-PATENT-APPL-SN-561702)

Avail: NTIS HC A02/MF A01 CSCL 07C

Amine terminated bispartimides, especially 4,4 prime-bis (N(2)-4-(4-aminophenoxy) phenylaspartimido) diphenylmethane are prepared by a Michael-type reaction of an aromatic bismaleimide and an aromatic diamine in an aprotic solvent. These bispartimides are thermally polymerized to yield tough, resinous polymers crosslinked through -NH- groups. Such polymers are useful in applications requiring materials with resistance to change at elevated temperatures, e.g., as lightweight laminates with graphite cloth, molding material prepreps, adhesives and insulating material. NASA

N84-20700*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

PROCESS FOR IMPROVING MOISTURE RESISTANCE OF EPOXY RESINS BY ADDITION OF CHROMIUM IONS Patent Application

A. K. ST.CLAIR, T. L. ST.CLAIR, D. M. STOAKLEY, and J. J. SINGH, inventors (to NASA) 3 Nov. 1983 17 p

(NASA-CASE-LAR-13226-1; US-PATENT-APPL-SN-548583)

Avail: NTIS HC A02/MF A01 CSCL 11B

A chromium ion-containing epoxy with improved resistance to moisture is produced wherein the chromium ions are believed to prevent the absorption of water molecules by themselves coordinating to the -OH groups on the epoxy chain. Three different and distinct processes for producing this result are described. The epoxy resins are based on diglycidyl ether of bisphenol A (DGEBA) and tetraglycidyl methylene dianiline (TGMDA). NASA

N84-20701*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

PROCESS FOR IMPROVING MOISTURE RESISTANCE OF EPOXY RESINS BY ADDITION OF COBALT IONS Patent Application

A. K. ST.CLAIR and D. M. STOAKLEY, inventors (to NASA) 3 Nov. 1983 17 p

(NASA-CASE-LAR-13230-1; US-PATENT-APPL-SN-548584)

Avail: NTIS HC A02/MF A01 CSCL 11B

A resin product useful as an adhesive, composite or casting resin and the process for its preparation are described which result in improved flexural strength mechanical property characteristics. This improved flexural strength is attained with little or no change in density, thermal stability or moisture resistance by chemically incorporating 1.2 to 10.6% by weight Co(III) ions in an epoxidized resin system. NASA

N84-16341*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

VINYL STYRYLPYRIDINES AND THEIR COPOLYMERIZATION WITH BISMALEIMIDE RESINS Patent Application

J. A. PARKER, A. H. HEIMBUCH, M. T. S. HSU (San Jose State Univ., Calif.), and T. S. CHEN, inventor (to NASA) (San Jose State Univ., Calif.) 18 Nov. 1983 21 p

(NASA-CASE-ARC-11429-1-CU; US-PATENT-APPL-SN-553339)

Avail: NTIS HC A02/MF A01 CSCL 07C

Vinyl pyridines including vinyl stilbazole materials and vinyl styrylpyridine oligomer materials are disclosed. These vinylpyridines

N84-20702*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

FIRE RESISTANT POLYMERS BASED ON 1-((DIALKOXYPHOSPHONYL)METHYL)-2,4-2,6-DIAMINO BENZENES Patent Application

J. A. MIKROYANNIDIS (NAS-NRC, Washington, D.C.) and D. A. KOURTIDES, inventors (to NASA) 9 Jan. 1984 13 p (NASA-CASE-ARC-11512-1; US-PATENT-APPL-SN-569373)
 Avail: NTIS HC A02/MF A01 CSCL 11B

Diacylhalides are reacted with 1-(dialkoxy or dihaloalkoxyphosphonyl)methyl-2,4- and 2,6- diamino benzenes to produce polyamides which have desirable heat and fire resistance properties. NASA

33

ELECTRONICS AND ELECTRICAL ENGINEERING

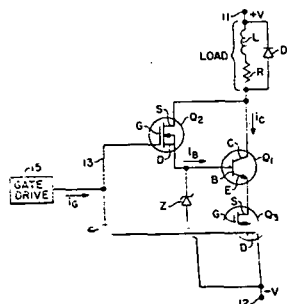
Includes test equipment and maintainability; components, e.g., tunnel diodes and transistors; microminiaturization; and integrated circuitry.

N84-11389*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

HYBRID POWER SEMICONDUCTOR SWITCH Patent Application

D. Y. CHEN, inventor (to NASA) 30 Sep. 1983 11 p (NASA-CASE-LEW-13922-1; US-PATENT-APPL-SN-537614)
 Avail: NTIS HC A02/MF A01 CSCL 09A

The voltage rating of a bipolar transistor may be greatly extended while at the same time reducing its switching time by operating it in conjunction with FETs in a hybrid circuit. One FET is used to drive the bipolar transistor and an inductive load. Both FETs are turned on or off by a single drive signal of load power, the second FET upon ceasing conduction, rendering one power electrode of the bipolar transistor open. Means provided to dissipate currents which flow after the bipolar transistor is rendered nonconducting. NASA



N84-14421* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

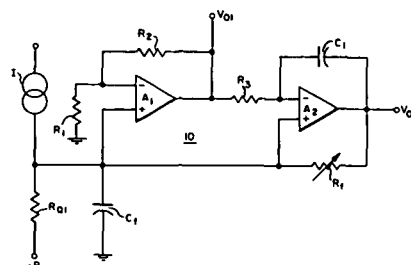
TUNED ANALOG NETWORK Patent

L. L. KLEINBERG, inventor (to NASA) 22 Nov. 1983 7 p Filed 10 Sep. 1981 Supersedes N82-10324 (20 - 01, p 0048) (NASA-CASE-GSC-12650-1; US-PATENT-4,417,215; US-PATENT-APPL-SN-301077; US-PATENT-CLASS-330-107; US-PATENT-CLASS-330-109) Avail: US Patent and Trademark Office CSCL 09C

A noninverting, direct current amplifier stage is cascaded into an integrator stage to form a two stage tuned network with a

single input junction common to both stages. The network provides independent adjustment of center frequency, bandwidth and voltage gain. The insertion of a positive feedback loop between the stages provides a very narrow bandwidth network. The addition of back to back zener diodes between the common input node and ground converts the network into an oscillator.

Official Gazette of the U.S. Patent and Trademark Office



N84-14422* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

ADDITIVE FOR ZINC ELECTRODES Patent

D. G. SOLTIS, D. W. SHEIBLEY, and W. J. NAGLE, inventors (to NASA) 29 Nov. 1983 4 p Filed 10 Jun. 1981 Supersedes N81-27597 (19 - 18, p 2506)

(NASA-CASE-LEW-13286-1; US-PATENT-4,418,130; US-PATENT-APPL-SN-272406; US-PATENT-CLASS-429-206; US-PATENT-CLASS-429-229; US-PATENT-CLASS-252-182.1)

Avail: US Patent and Trademark Office CSCL 10C

A zinc electrode for alkaline cells includes up to about ten percent by weight of Ba(OH)2.8H2O with about five percent being preferred. The zinc electrode may or may not be amalgamated with mercury.

Official Gazette of the U.S. Patent and Trademark Office

N84-14423* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

ELECTRICAL SELF-ALIGNING CONNECTOR Patent

K. H. CLARK and D. R. SCOTT, inventors (to NASA) 20 Dec. 1983 9 p Filed 30 Sep. 1982 Supersedes N83-29592 (21 - 18, p 2929)

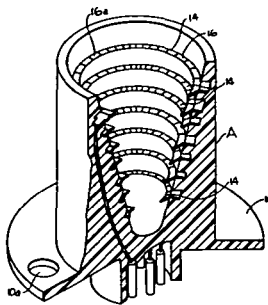
(NASA-CASE-MFS-25211-2; US-PATENT-4,421,371; US-PATENT-APPL-SN-432057; US-PATENT-CLASS-339-64M; US-PATENT-CLASS-339-258RR; US-PATENT-CLASS-339-262RR) Avail: US Patent and Trademark Office CSCL 09A

A self-aligning electrical connector device includes a receptacle component having a conically contoured interior and a plug component having a correspondingly contoured conical body receivable in the receptacle component. The plug component has a number of spaced conductive ring elements with a mating face and the receptacle component includes corresponding spaced conductive ring elements providing mating interface with the mating face of the ring elements of the plug component when connected to it. Each ring element of the receptacle component has several segmented portions which deflect downwardly when the plug component is inserted. A biasing force is asserted against the face of the ring elements of the plug component providing positive

33 ELECTRONIC AND ELECTRICAL ENGINEERING

electrical contact and connection between the ring elements of the components.

Official Gazette of the U.S. Patent and Trademark Office



N84-14424* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

CONTROL SYSTEM FOR AN INDUCTION MOTOR WITH ENERGY RECOVERY Patent

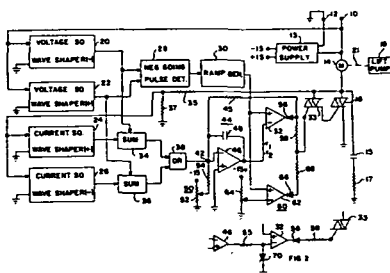
F. J. NOLA, inventor (to NASA) 22 Nov. 1983 10 p Filed 19 Feb. 1982 Supersedes N82-22437 (20 - 13, p 1788) Continuation-in-part of US Patent Appl-SN-243683, filed 16 Mar. 1981 and US Patent Appl-SN-297524, 28 Aug. 1981

(NASA-CASE-MFS-25477-1; US-PATENT-4,417,190; US-PATENT-APPL-SN-350472; US-PATENT-APPL-SN-243683; US-PATENT-APPL-SN-297524; US-PATENT-CLASS-318-729; US-PATENT-CLASS-318-798; US-PATENT-CLASS-318-806)

Avail: US Patent and Trademark Office CSCL 10C

A control circuit for an induction motor powered system is disclosed in which a power factor controlled servo loop is used to control, via the phase angle of firing of a triac, the power input to the motor, as a function of load placed on the motor by machinery of the powered system. Then, upon application of torque by this machinery to the motor, which tends to overspeed the motor, the firing angle of the triac is automatically set to a fixed, and relatively short, firing angle.

Official Gazette of the U.S. Patent and Trademark Office

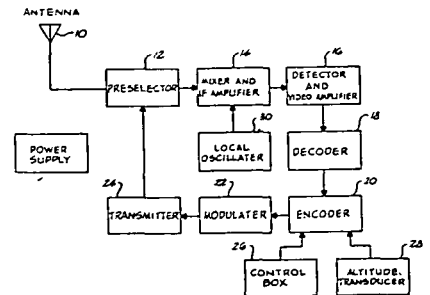


(NASA-CASE-KSC-11155-1; US-PATENT-APPL-SN-425201)

Avail: NTIS HC A02/MF A01 CSCL 09C

A circuit is disclosed for use in a transponder located in an aircraft or the like for identifying a true side lobe suppression signal being transmitted by a ground located transmitted system. The true side lobe suppression signal includes at least pulses P1 and P2. The circuit causes the transponder to produce a reply signal upon the amplitude of the P1 pulse being a predetermined ratio to said P2 pulse. The circuit includes a pair of transistors with a capacitor connected to the output of the second transistor. The pulses P1 and P2 are supplied to the base electrode of the first transistor. Pulse P1 turns on the two transistors and charges the capacitor to a predetermined level so that when the second pulse P2 arrives, it does not turn on a transistor when it is equal to or less than the first pulse P1.

NASA



N84-16452* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

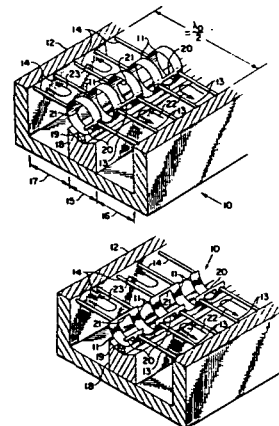
LADDER SUPPORTED RING BAR CIRCUIT Patent

H. G. KOSMAHL, inventor (to NASA) 10 Dec. 1983 6 p Filed 3 Apr. 1981 Supersedes N81-24348 (19 - 15, p 2050)

(NASA-CASE-LEW-13570-1; US-PATENT-4,422,012; US-PATENT-APPL-SN-251009; US-PATENT-CLASS-315-3.5; US-PATENT-CLASS-315-3.6; US-PATENT-CLASS-315-39.3; US-PATENT-CLASS-333-162) Avail: US Patent and Trademark Office CSCL 09C

An improved slow wave circuit especially useful in backward wave oscillators includes a slow wave circuit in a waveguide. The slow wave circuit is comprised of rings disposed between and attached to respective stubs. The stubs are attached to opposing sidewalls of the waveguide. To the end that opposed, interacting magnetic fields will be established to provide a very high coupling impedance for the slow wave structure, axially orientated bars are connected between rings in alternate spaces and adjacent to the attachment points of stubs. Similarly, axial bars are connected between rings in the spaces which do not include bars and at points adjacent to the attachment of bars.

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N84-15395*# National Aeronautics and Space Administration. John F. Kennedy Space Center, Cocoa Beach, Fla.

VIDEO PROCESSOR FOR AIR TRAFFIC CONTROL BEACON SYSTEM Patent Application

F. BYRNE, inventor (to NASA) 28 Sep. 1982 10 p

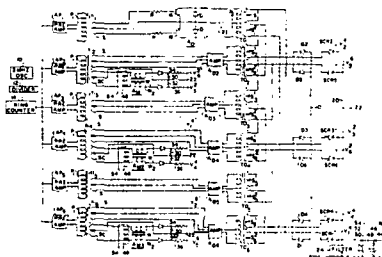
N84-16453* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

A DC TO DC CONVERTER Patent

A. E. WILLIS, J. M. GOULD, J. L. MATHENEY, and H. GARRETT, inventors (to NASA) 17 Jan. 1984 7 p Filed 28 May 1982 Supersedes N82-28550 (20 - 19, p 2680) (NASA-CASE-MFS-25430-1; US-PATENT-4,426,678; US-PATENT-APPL-SN-383083; US-PATENT-CLASS-363-25; US-PATENT-CLASS-363-65; US-PATENT-CLASS-363-67; US-PATENT-CLASS-363-71) Avail: US Patent and Trademark Office CSCL 09A

The object of the invention is to provide an improved converter for converting one direct current voltage to another. A plurality of phased square wave voltages are provided from a ring counter through amplifiers to a like plurality of output transformers. Each of these transformers has two windings, and S(1) winding and an S(2) winding. The S(1) windings are connected in series, then the S(2) windings are connected in series, and finally, the two sets of windings are connected in series. One of six SCRs is connected between each two series connected windings to a positive output terminal and one of diodes is connected between each set of two windings of a zero output terminal. By virtue of this configuration, a quite high average direct current voltage is obtained, which varies between full voltage and two-thirds full voltage rather than from full voltage to zero. Further, its variation, ripple frequency, is reduced to one-sixth of that present in a single phase system. Application to raising battery voltage for an ion propulsion system is mentioned.

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N84-16454* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

HIGH STABILITY BUFFERED PHASE COMPARATOR Patent

W. A. ADAMS and V. S. REINHARDT, inventors (to NASA) 10 Jan. 1984 11 p Filed 17 Jul. 1981 Supersedes N81-31482 (19 - 22, p 3057)

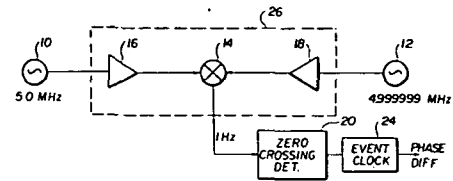
(NASA-CASE-GSC-12645-1; US-PATENT-4,425,543; US-PATENT-APPL-SN-284314; US-PATENT-CLASS-324-83R; US-PATENT-CLASS-324-79R; US-PATENT-CLASS-324-83A; US-PATENT-CLASS-328-133; US-PATENT-CLASS-330-289)

Avail: US Patent and Trademark Office CSCL 09A

A low noise RF signal phase comparator comprised of two high stability driver buffer amplifiers driving a double balanced mixer which operate to generate a beat frequency between the two RF input signals coupled to the amplifiers from the RF sources is described. The beat frequency output from the mixer is applied to a low noise zero crossing detector which is the phase difference between the two RF inputs. Temperature stability is provided by mounting the amplifiers and mixer on a common circuit board with the active circuit elements located on one side of a circuit board and the passive circuit elements located on the opposite side. A common heat sink is located adjacent the circuit board. The active circuit elements are embedded into the bores of the heat sink which slows the effect of ambient temperature changes

and reduces the temperature gradients between the active circuit elements, thus improving the cancellation of temperature effects. The two amplifiers include individual voltage regulators, which increases RF isolation.

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N84-16455* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

PULSED THYRISTOR TRIGGER CONTROL CIRCUIT Patent

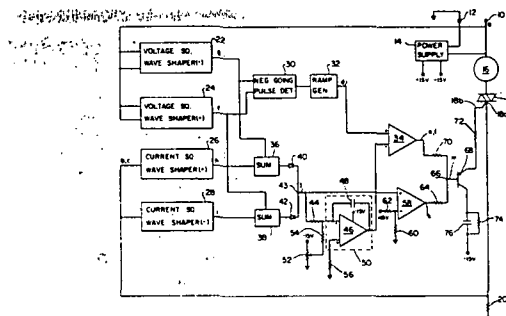
F. J. NOLA, inventor (to NASA) 17 Jan. 1984 7 p Filed 30 Nov. 1981 Supersedes N82-24428 (20 - 15, p 2079)

(NASA-CASE-MFS-25616-1; US-PATENT-4,426,614; US-PATENT-APPL-SN-325932; US-PATENT-CLASS-323-243; US-PATENT-CLASS-318-799; US-PATENT-CLASS-323-246)

Avail: US Patent and Trademark Office CSCL 09C

A trigger control circuit is provided for producing firing pulses for the thyristor of a thyristor control system such as a power factor controller. The control circuit overcomes thyristor triggering problems involved with the current lag associated with controlling inductive loads and utilizes a phase difference signal, already present in the power factor controller, in deriving a signal for inhibiting generation of a firing pulse until no load current is flowing from the preceding half cycle and thereby ensuring that the thyristor is triggered on during each half cycle.

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N84-16456* National Aeronautics and Space Administration. Pasadena Office, Calif.

ELECTRODES FOR SOLID STATE DEVICES Patent

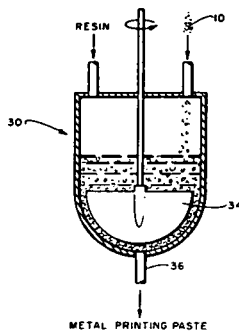
D. B. BICKLER, inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) 14 Jan. 1983 6 p Filed 25 Nov. 1981 Supersedes N82-26574 (20 - 17, p 2397)

(NASA-CASE-NPO-15161-1; US-PATENT-4,388,346; US-PATENT-APPL-SN-325083; US-PATENT-CLASS-427-58; US-PATENT-CLASS-427-75; US-PATENT-CLASS-427-88; US-PATENT-CLASS-427-96; US-PATENT-CLASS-427-216; US-PATENT-CLASS-427-217; US-PATENT-CLASS-427-226; US-PATENT-CLASS-427-376.6; US-PATENT-CLASS-427-376.7;

34 FLUID MECHANICS AND HEAT TRANSFER

US-PATENT-CLASS-427-436; US-PATENT-CLASS-427-437)
Avail: US Patent and Trademark Office CSCL 09A

The invention relates to coated metal powders and to dispersions of such powders in liquid vehicles forming screenable, sinterable pastes for use in forming electrodes on photovoltaic devices. The primary nickel or copper metal particles are provided with a carrier of lower melting sintering metals such as 1-20% by weight, of a non-oxidizing metal such as lead or tin. The powdered metal systems operate on the basis of fusing together by way of eutectic alloying. As the paste is heated during firing the organic binder is first vaporized. An eutectic of the base metal (copper) and coating (tin) forms at the intersections of the base metal grains. This eutectic dissolves the grains and as the temperature is raised above the eutectic temperature, more of the base metal is dissolved. While the temperature is held at the higher value, the much smaller amount of sintering metal disappears as the eutectic dissolves and diffuses into the base metal until the composition of the eutectic is so enriched with base metal that it no longer has the eutectic properties and it solidifies. In this high temperature solidification, the base metal grains become thoroughly alloyed together and will not separate at the eutectic temperature (a lower temperature than their solidification by diffusion). T.M.



34

FLUID MECHANICS AND HEAT TRANSFER

Includes boundary layers; hydrodynamics; fluidics; mass transfer; and ablation cooling.

N84-12406* National Aeronautics and Space Administration.
Marshall Space Flight Center, Huntsville, Ala.

CONSTANT-OUTPUT ATOMIZER Patent

J. Y. DEA, inventor (to NASA) (Nevada Univ. System, Reno) 8
Nov. 1983 4 p Filed 2 Oct. 1981 Supersedes N82-10360 (20
- 01, p 0053) Sponsored by NASA

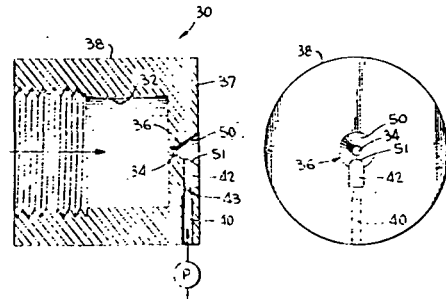
(NASA-CASE-MFS-25631-1; US-PATENT-4,413,784;
US-PATENT-APPL-SN-308203; US-PATENT-CLASS-239-426)

Avail: US Patent and Trademark Office CSCL 20D

A constant-output atomizer includes a body which has a generally frustoconical expansion nozzle for producing an air jet when a supply of pressurized air is connected to the nozzle upstream of the throat of the nozzle. A liquid feed line supplies liquid to be atomized by the air jet, and the body includes a groove which opens into the diffuser section of the nozzle downstream of the throat for conducting liquid from the feed line to the nozzle. The groove which extends in a direction perpendicular to the axis of the nozzle, and radially with respect to it, has a depth approximately equal to half the axial length of the nozzle. Liquid, conducted by capillary action in the groove to the nozzle,

is atomized into a fine mist by the air jet in the nozzle; and the groove eliminates fluctuations in spray order.

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N84-14461* National Aeronautics and Space Administration.
Goddard Space Flight Center, Greenbelt, Md.

THERMAL CONTROL SYSTEM Patent

D. R. HEWITT, inventor (to NASA) 13 Dec. 1983 12 p Filed
15 Oct. 1982 Supersedes N83-12361 (21 - 03, p 0366)

(NASA-CASE-GSC-12771-1; US-PATENT-4,420,035;

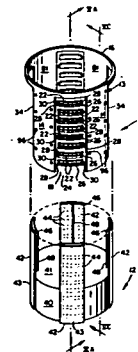
US-PATENT-APPL-SN-434672; US-PATENT-CLASS-165-32;

US-PATENT-CLASS-165-41; US-PATENT-CLASS-165-96) Avail:

US Patent and Trademark Office CSCL 20M

The temperature of an exothermic process plant carried aboard an Earth orbiting spacecraft is regulated using a number of curved radiator panels accurately positioned in a circular arrangement to form an open receptacle. A module containing the process is insertable into the receptacle. Heat exchangers having broad exterior surfaces extending axially above the circumference of the module fit within arcuate spacings between adjacent radiator panels. Banks of variable conductance heat pipes partially embedded within and thermally coupled to the radiator panels extend across the spacings and are thermally coupled to broad exterior surfaces of the heat exchangers by flanges. Temperature sensors monitor the temperature of process fluid flowing from the module through the heat exchangers. Thermal conduction between the heat exchangers and the radiator panels is regulated by heating a control fluid within the heat pipes to vary the effective thermal length of the heat pipes in inverse proportion to changes in the temperature of the process fluid.

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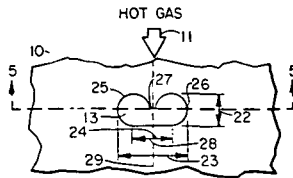


N84-20782* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

VORTEX GENERATING FLOW PASSAGE DESIGN FOR INCREASED FILM COOLING EFFECTIVENESS Patent Application

S. S. PAPELL, inventor (to NASA) 15 Feb. 1984 15 p
(NASA-CASE-LEW-14039-1; US-PATENT-APPL-SN-580419)
Avail: NTIS HC A02/MF A01 CSCL 20D

A cooling fluid is injected into a hot flowing gas through a passageway in a wall which contains and is subject to the hot gas. The passageway is slanted in a downstream direction at an acute angle to the wall. A cusp shape is provided in the passageway to generate vortices in the injected cooling fluid thereby reducing the energy extracted from the hot gas for that purpose. The cusp shape increases both film cooling effectiveness and wall area coverage. The cusp may be at either the downstream or upstream side of the passageway, the former substantially eliminating flow separation of the cooling fluid from the wall immediately downstream of the passageway. NASA



35

INSTRUMENTATION AND PHOTOGRAPHY

Includes remote sensors; measuring instruments and gages; detectors; cameras and photographic supplies; and holography.

N84-12443* National Aeronautics and Space Administration. Flight Research Center, Edwards, Calif.

INFLATABLE DEVICE FOR INSTALLING STRAIN GAGE BRIDGES Patent

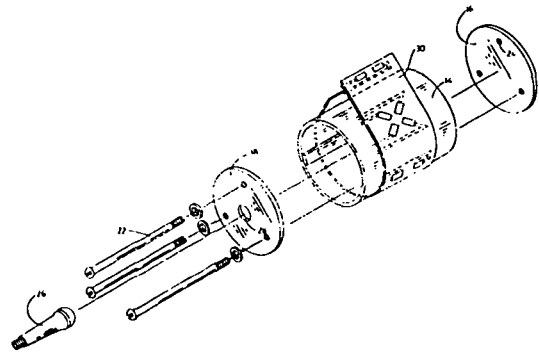
C. E. COOK, G. E. SMITH, and R. C. MONAGHAN, inventors (to NASA) 4 Oct. 1983 7 p Filed 17 Nov. 1981 Supersedes N82-24473 (20 - 15, p 2086)

(NASA-CASE-FRC-11068-1; US-PATENT-4,407,686;
US-PATENT-APPL-SN-322314; US-PATENT-CLASS-156-215;
US-PATENT-CLASS-156-71; US-PATENT-CLASS-156-230;
US-PATENT-CLASS-156-235; US-PATENT-CLASS-156-294;
US-PATENT-CLASS-156-391; US-PATENT-CLASS-156-423;
US-PATENT-CLASS-156-540; US-PATENT-CLASS-338-2) Avail:
US Patent and Trademark Office CSCL 14B

Methods and devices for installing in a tubular shaft multiple strain gages are disclosed with focus on a method and a device for pneumatically forcing strain gages into seated engagement with the internal surfaces of a tubular shaft in an installation of multiple strain gages in a tubular shaft. The strain gages or other electron devices are seated in a template-like component which is wrapped about a pneumatically expansible body. The component

is inserted into a shaft and the body is pneumatically expanded after a suitable adhesive was applied to the surfaces.

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N84-12444* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

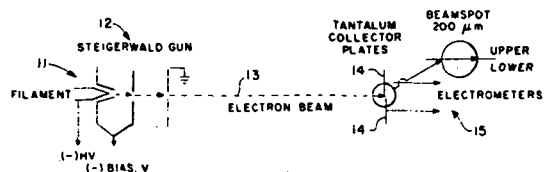
LOW ENERGY ELECTRON MAGNETOMETER USING A MONOENERGETIC ELECTRON BEAM Patent

J. J. SINGH (Univ. of Southern Mississippi, Hattiesburg), G. M. WOOD (Univ. of Southern Mississippi, Hattiesburg), G. H. RAYBORN (Univ. of Southern Mississippi, Hattiesburg), and F. A. WHITE, inventors (to NASA) (Univ. of Southern Mississippi, Hattiesburg) 8 Nov. 1983 9 p Filed 26 Nov. 1980 Supersedes N81-19428 (19 - 10, p 1350) Sponsored by NASA

(NASA-CASE-LAR-12706-1; US-PATENT-4,414,509;
US-PATENT-APPL-SN-210498; US-PATENT-CLASS-324-250;
US-PATENT-CLASS-328-230; US-PATENT-CLASS-372-74)
Avail: US Patent and Trademark Office CSCL 14B

A low energy electron beam magnetometer utilizes near-monoenergetic electrons thereby reducing errors due to electron energy spread and electron nonuniform angular distribution. In a first embodiment, atoms in an atomic beam of an inert gas are excited to a Rydberg state and then electrons of near zero energy are detached from the Rydberg atoms. The near zero energy electrons are then accelerated by an electric field V_{acc} to form the electron beam. In a second embodiment, a filament emits electrons into an electrostatic analyzer which selects electrons at a predetermined energy level within a very narrow range. These selected electrons make up the electron beam that is subjected to the magnetic field being measured.

Official Gazette of the U.S. Patent and Trademark



N84-12445* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

RIDE QUALITY METER Patent

J. D. LEATHERWOOD, T. K. DEMPSEY, S. A. CLEVENSON, and D. G. STEPHENS, inventors (to NASA) 8 Nov. 1983 11 p Filed 22 May 1981 Supersedes N81-31848 (19 - 22, p 3107)

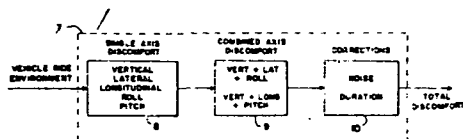
(NASA-CASE-LAR-12882-1; US-PATENT-4,413,522;

35 INSTRUMENTATION AND PHOTOGRAPHY

US-PATENT-APPL-SN-267179; US-PATENT-CLASS-73-646;
US-PATENT-CLASS-73-658; US-PATENT-CLASS-364-415)
Avail: US Patent and Trademark Office CSCL 14B

A ride quality meter is disclosed that automatically transforms vibration and noise measurements into a single number index of passenger discomfort. The noise measurements are converted into a noise discomfort value. The vibrations are converted into single axis discomfort values which are then converted into a combined axis discomfort value. The combined axis discomfort value is corrected for time duration and then summed with the noise discomfort value to obtain a total discomfort value.

Official Gazette of the U.S. Patent and Trademark Office

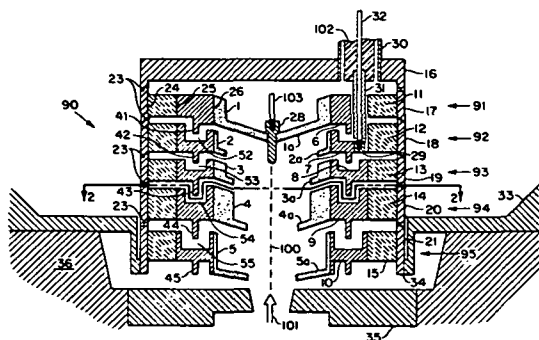


N84-12447*# National Aeronautics and Space Administration.
Lewis Research Center, Cleveland, Ohio.

A MULTISTAGE SPENT PARTICLE COLLECTOR AND A METHOD FOR MAKING SAME Patent Application

B. T. EBIHARA, inventor (to NASA) 30 Sep. 1983 12 p
(NASA-CASE-LEW-13914-1; US-PATENT-APPL-SN-537615)
Avail: NTIS HC A02/MF A01 CSCL 14B

A spent particle collector is comprised of one or more axisymmetric stages, each stage comprising a subassembly having an inner pyrolytic graphite ring, a transition ring, a ceramic insulator ring, and an outer metal ring which forms part of the wall of the collector. Each transition ring is of a ductile metal having high thermal conductivity and is provided with an annular sputter shield wall extending toward the source of spent particles and, where necessary, a trough in the other surface to enclose the sputter shield of the next adjacent transition ring. Radial extending slots are provided in a transition ring to form segments which are retained in their position by the sputter shield. This arrangement with the ceramic ring outwardly of the transition ring keeps the latter in contact with the inner pyrolytic graphite ring. This multistage collector can be assembled with high accuracy. The collector is attached by welding to a flange attached to a source of spent particles such as a traveling wave tube. NASA

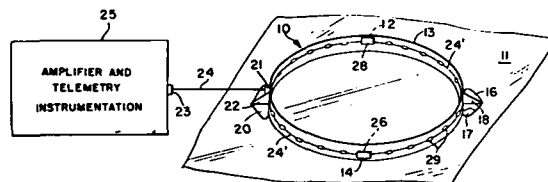


N84-12448*# National Aeronautics and Space Administration.
Wallops Flight Center, Wallops Island, Va.

THIN FILM STRAIN TRANSDUCER Patent Application

J. L. RAND, inventor (to NASA) (Southwest Research Inst., San Antonio, Tex.) 26 Aug. 1983 13 p Sponsored by NASA
(US-PATENT-APPL-SN-526770; NASA-CASE-WLP-10055-2)
Avail: NTIS HC A02/MF A01 CSCL 14B

On a beryllium-copper ring are four strain gages which are electrically connected in Wheatstone bridge fashion to output instrumentation. Tabs are bonded to a balloon or like surface where strain on the surface causes bending of the ring. An electrical signal is provided through the gages proportional to the surface strain. A one-half ring segment, as placed on a sheet of beryllium-copper for chem-mill etch formation prior to bending and welding of a pair of the segments to form a ring structure, is illustrated. NASA



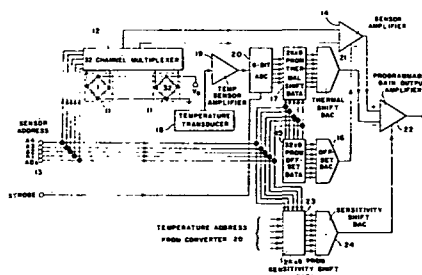
N84-14491* National Aeronautics and Space Administration.
Langley Research Center, Hampton, Va.

SELF-CORRECTING ELECTRONICALLY SCANNED PRESSURE SENSOR Patent

C. GROSS, inventor (to NASA) 16 Aug. 1983 7 p Filed 31 Mar. 1981 Supersedes N81-27121 (19 - 18, p 2437)
(NASA-CASE-LAR-12686-1; US-PATENT-4,399,515;
US-PATENT-APPL-SN-249304; US-PATENT-CLASS-364-571;
US-PATENT-CLASS-364-557; US-PATENT-CLASS-364-558;
US-PATENT-CLASS-73-714) Avail: US Patent and Trademark Office CSCL 14B

A multiple channel high data rate pressure sensing device is disclosed for use in wind tunnels, spacecraft, airborne, process control, automotive, etc., pressure measurements. Data rates in excess of 100,000 measurements per second are offered with inaccuracies from temperature shifts less than 0.25% (nominal) of full scale over a temperature span of 55 C. The device consists of thirty-two solid state sensors, signal multiplexing electronics to electronically address each sensor, and digital electronic circuitry to automatically correct the inherent thermal shift errors of the pressure sensors and their associated electronics.

Official Gazette of the U.S. Patent and Trademark Offices



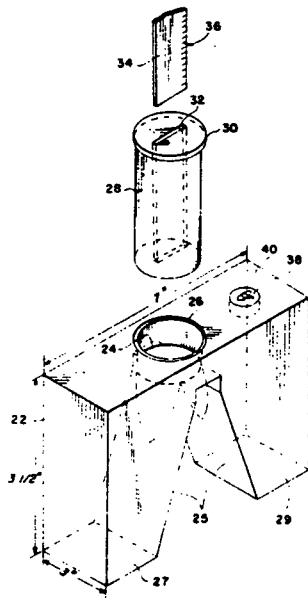
N84-16523* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

ROTARY TARGET V-BLOCK Patent

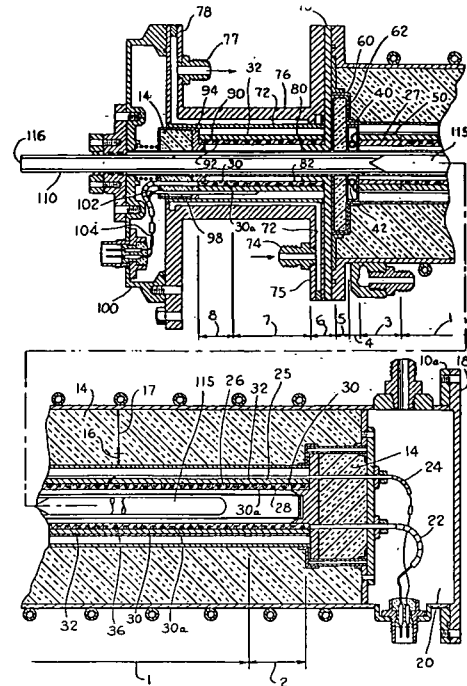
C. W. MANN, inventor (to NASA) 31 Jan. 1984 6 p Filed 26 Feb. 1982 Supersedes N83-25542 (21 - 14, p 2320) (NASA-CASE-LAR-12007-3; US-PATENT-4,428,122; US-PATENT-APPL-SN-352831; US-PATENT-CLASS-33-293) Avail: US Patent and Trademark Office CSCL 14B

A device used in the optical alignment of machinery to maintain a measuring scale in the proper position for optical readings to be taken is described. The device consists of a block containing a notch in the shape of an inverted "v" and a rotatable plug positioned over the centerline of notch. The block is placed on the object to be aligned, the notch allows the block to be securely placed upon flat or curved surfaces. A weighted measuring scale is inserted through plug so that it contacts the object to be aligned. The scale and plug combination can be rotated so that the scale faces an optical aligning instrument. The instrument is then used in conjunction with the scale to measure the distance of the machinery from a reference plane.

Official Gazette of the U.S. Patent and Trademark Office



by additional heating elements. A heat transfer plate provides a means by which heat may be extracted from the furnace and conducted away through liquid cooled jackets. By varying the input of heat via the booster heater and output of heat via the heat transfer plate, a desired thermal gradient profile may be provided. NASA



N84-17555* National Aeronautics and Space Administration. Pasadena Office, Calif.

APPARATUS AND METHOD FOR DESTRUCTIVE REMOVAL OF PARTICLES CONTAINED IN FLOWING FLUID Patent

L. C. YANG, ed. (JPL, California Inst. of Tech., Pasadena) 14 Oct. 1980 14 p Filed 14 Oct. 1980 Supersedes N83-20447 (21 - 10, p 1567) Sponsored by NASA

(NASA-CASE-NPO-15426-1; US-PATENT-4,376,637; US-PATENT-APPL-SN-196877; US-PATENT-CLASS-55-2; US-PATENT-CLASS-55-6; US-PATENT-CLASS-55-12; US-PATENT-CLASS-55-96; US-PATENT-CLASS-55-105; US-PATENT-CLASS-55-126; US-PATENT-CLASS-55-131; US-PATENT-CLASS-55-138; US-PATENT-CLASS-55-139; US-PATENT-CLASS-55-283; US-PATENT-CLASS-55-291; US-PATENT-CLASS-55-466; US-PATENT-CLASS-55-DIG.25; US-PATENT-CLASS-55-DIG.30; US-PATENT-CLASS-55-270; US-PATENT-CLASS-55-145; US-PATENT-CLASS-60-275; US-PATENT-CLASS-60-303; US-PATENT-CLASS-60-311; US-PATENT-CLASS-422-121; US-PATENT-CLASS-422-169; US-PATENT-CLASS-422-178; US-PATENT-CLASS-422-186; US-PATENT-CLASS-210-748) Avail: US Patent and Trademark Office CSCL 14B

An apparatus and method for destructively removing particles from a flowing gas containing the particles is described. In the specific embodiments disclosed the apparatus is adapted to remove carbon particles from diesel engine exhaust products. The exhaust products are directed to a predetermined location where they are rapidly vaporized and combine with oxygen in the exhaust products to form carbon dioxide. Vaporization in one embodiment is effected by a discharge grid located within an exhaust conduit, the grid

N84-16531*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

HIGH GRADIENT DIRECTIONAL SOLIDIFICATION FURNACE Patent Application

B. R. ALDRICH and W. D. WHITT, inventors (to NASA) 17 Jan. 1984 19 p (NASA-CASE-MFS-25963-1; US-PATENT-APPL-SN-571614) Avail: NTIS HC A02/MF A01 CSCL 14B

A high gradient directional solidification furnace is disclosed which includes eight thermal zones throughout the length of the furnace. In the hot end of the furnace, furnace elements provide desired temperatures. These elements include Nichrome wire received in a grooved tube which is encapsulated by an outer alumina core. A booster heater is provided in the hot end of the furnace which includes toroidal tungsten/rhenium wire which has a capacity to put heat quickly into the furnace. An adiabatic zone is provided by an insulation barrier to separate the hot end of the furnace from the cold end. The cold end of the furnace is defined

35 INSTRUMENTATION AND PHOTOGRAPHY

being chosen so that alternate conductors defining the grid are spaced apart a distance approximately 125 times the mean diameter of the particles to be removed. A voltage differential of approximately 690 volts is applied across adjacent conductors.

Office Gazette of the U.S. Patent and Trademark Office

N84-20804*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

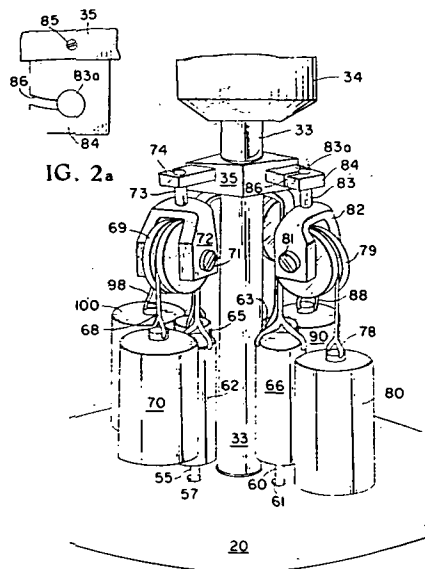
TENSILE TESTING APPARATUS Patent Application

L. B. BLACKBURN and J. R. ELLINGSWORTH, inventors (to NASA) 19 Mar. 1984 21 p

(NASA-CASE-LAR-13243-1; US-PATENT-APPL-SN-590923)

Avail: NTIS HC A02/MF A01 CSCL 14B

A mechanical extensometer for use with a constant load creep test machine is disclosed in which the dead weight of the extensometer is counterbalanced by two pairs of weights connected through a pulley system to rod extensions leading into the furnace where test sample is undergoing elevated temperature (above 500 F) tensile testing. Gripper surfaces, conical tip and flat surface, are provided in each sample engaging platens to reduce the grip pressure normally required for attachment of the extensometer to the specimen and reduce initial specimen bending normally associated with foil-gage metal testing. NASA



N84-20808*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

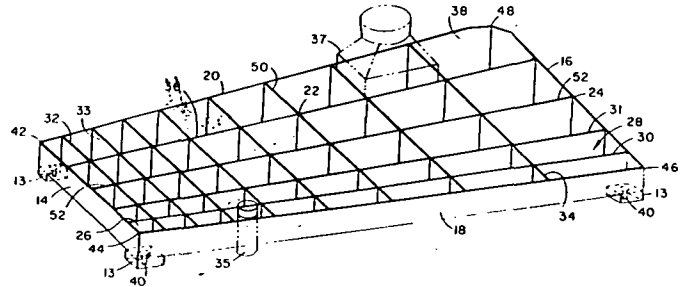
LABORATORY GLASSWARE RACK FOR SEISMIC SAFETY Patent Application

M. M. COHEN, inventor (to NASA) 16 Aug. 1983 18 p (NASA-CASE-ARC-11422-1; US-PATENT-APPL-SN-523991)

Avail: NTIS HC A02/MF A01 CSCL 14B

A rack for laboratory bottles and jars for chemicals and medicines was designed to provide the maximum strength and

security to the glassware in the event of a significant earthquake. The rack preferably is rectangular and may be made of a variety of chemically resistant materials including polypropylene, polycarbonate, and stainless steel. It comprises a first plurality of parallel vertical walls, and a second plurality of parallel vertical walls perpendicular to the first plurality of walls. These intersecting vertical walls comprise a self-supporting structure without a bottom which sits on four legs. The top surface of the rack is formed by the top edges of all the vertical walls, which are not parallel but are skewed in three dimensions. NASA



36

LASERS AND MASERS

Includes parametric amplifiers.

N84-12463*# National Aeronautics and Space Administration. Pasadena Office, Calif.

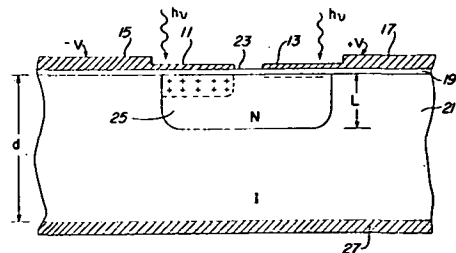
LASER ACTIVATED MTOS MICROWAVE DEVICE Patent Application

J. MASERJIAN, inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) 14 Oct. 1983 13 p (Contract NAS7-100)

(NASA-CASE-NPO-16112-1; US-PATENT-APPL-SN-542232)

Avail: NTIS HC A02/MF A01 CSCL 20E

A light-activated semiconductor device usable as an opto-electronic switch, pulse generator or optical detector is provided. A semiconductor device is disclosed which provides back-to-back metal-thin oxide-silicon (MTOS) capacitors. Each capacitor includes a thin, light-absorptive aluminum electrode which overlies a thin oxide layer and a lightly doped region implanted in an intrinsic silicon substrate. NASA



N84-14509* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

LASER RESONATOR Patent

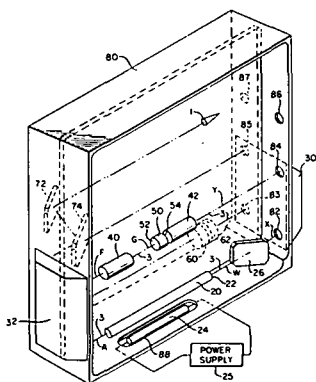
L. L. HARPER, inventor (to NASA) (International Laser Systems, Inc., Orlando, Fla.) 13 Dec. 1983 10 p Filed 5 Jun. 1981 Supersedes N82-24485 (20 - 15, p 2088)

(NASA-CASE-GSC-12565-1; US-PATENT-4,420,836; US-PATENT-APPL-SN-270763; US-PATENT-CLASS-372-98; US-PATENT-CLASS-372-100; US-PATENT-CLASS-372-108; US-PATENT-CLASS-372-93; US-PATENT-CLASS-372-94; US-PATENT-CLASS-350-299; US-PATENT-CLASS-356-345)

Avail: US Patent and Trademark Office CSCL 20E

An optical resonator cavity configuration has a unitary mirror with oppositely directed convex and concave reflective surfaces disposed into one fold and concertedly reversing both ends of a beam propagating from a laser rod disposed between two total internal reflection prisms. The optical components are rigidly positioned with perpendicularly crossed virtual rooflines by a compact optical bed. The rooflines of the internal reflection prisms, are arranged perpendicularly to the axis of the laser beam and to the optical axes of the optical resonator components.

Official Gazette of the U.S. Patent and Trademark Office



N84-15536*# National Aeronautics and Space Administration. Pasadena Office, Calif.

MASER CAVITY SERVO-TUNING SYSTEM Patent Application

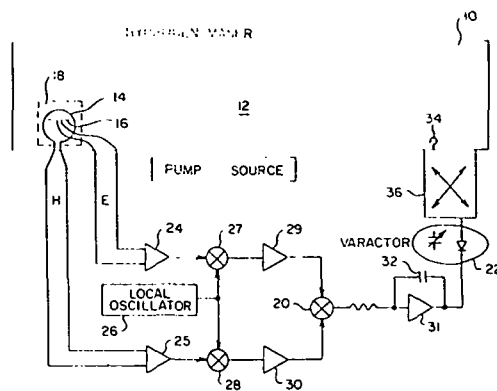
R. L. SYDNOR, inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) 30 Nov. 1983 15 p (Contract NAS7-100)

(NASA-CASE-NPO-15890-1; US-PATENT-APPL-SN-556513)

Avail: NTIS HC A02/MF A01 CSCL 20E

Two collocated, weakly coupled probes, one loop and one dipole, detect the magnetic and electric fields inside a maser cavity. Signals from the probes are compared in phase, and the signal output from the phase detector is applied to a varactor, the reactance of which is coupled into the cavity by a microwave coupler. Alternatively, the varactor may be placed inside the cavity. Any deviation of phase from 90 deg as detected by the phase detector will then produce an error signal that will change the reactance coupled into the resonant cavity to change its reactance, and thus correct its resonance frequency. An alternative to using

two probes is to use a single disk probe oriented to detect both the magnetic and electric fields, and thus provide the error signal directly. NASA



N84-15537*# National Aeronautics and Space Administration. Pasadena Office, Calif.

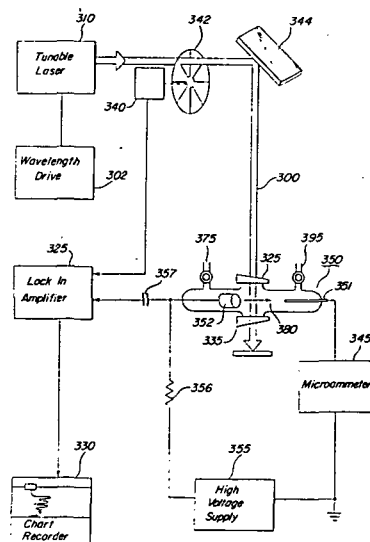
DISCHARGE CELL FOR OPTOGALVANIC SPECTROSCOPY HAVING ORTHOGONAL RELATIONSHIP BETWEEN THE PROBE LASER AND DISCHARGE AXIS Patent Application

C. R. WEBSTER, inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) 30 Nov. 1983 32 p (Contract NAS7-100)

(NASA-CASE-NPO-16271-1; US-PATENT-APPL-SN-556514)

Avail: NTIS HC A03/MF A01 CSCL 20E

A method and apparatus for an optogalvanic spectroscopy system is presented. Orthogonal geometry exists between the axis of a laser probe beam and the axis of a discharge created by a pair of spaced apart and longitudinally aligned high voltage electrodes. The electrodes are movable to permit adjustment of the location of a point in the discharge which is to be irradiated by a laser beam crossing the discharge region. The cell dimensions are selected so that the cross section of the discharge region is substantially comparable in size to the cross section of the laser beam passing orthogonally through the discharge region. E.A.K.



36 LASERS AND MASERS

N84-16542* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

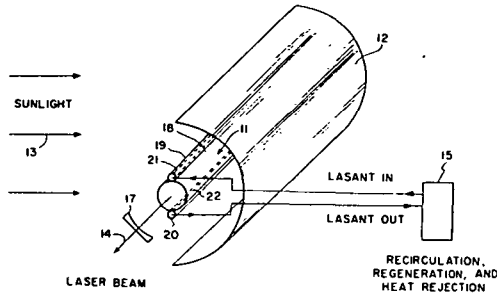
SOLAR PUMPED LASER Patent

J. H. LEE, F. HOHL, and W. R. WEAVER, inventors (to NASA)
3 Jan. 1984 11 p Filed 4 Dec. 1981 Supersedes N82-25497
(20 - 16, p 2238)

(NASA-CASE-LAR-12870-1; US-PATENT-4,424,592;
US-PATENT-APPL-SN-317658; US-PATENT-CLASS-372-79;
US-PATENT-CLASS-372-55) Avail: US Patent and Trademark
Office CSCL 20E

A solar pumped laser is described in which the lasant is a gas that will photodissociate and lase when subjected to sunrays. Sunrays are collected and directed onto the gas lasant to cause it to lase. Applications to laser propulsion and laser power transmission are discussed.

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37

MECHANICAL ENGINEERING

Includes auxiliary systems (non-power); machine elements and processes; and mechanical equipment.

N84-11497* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

RESILIENT SEAL RING ASSEMBLY WITH SPRING MEANS APPLYING FORCE TO WEDGE MEMBER Patent

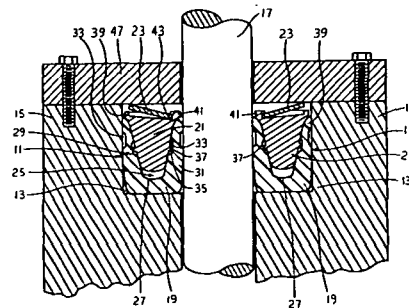
W. N. MYERS and L. A. HEIN, inventors (to NASA) 18 Oct. 1983 5 p Filed 13 May 1982 Supersedes N82-25517 (20 - 16, p 2241)

(NASA-CASE-MFS-25678-1; US-PATENT-4,410,189;
US-PATENT-APPL-SN-378533; US-PATENT-CLASS-277-177;
US-PATENT-CLASS-277-124; US-PATENT-CLASS-277-164;
US-PATENT-CLASS-277-190; US-PATENT-CLASS-277-116.6)
Avail: US Patent and Trademark Office CSCL 11A

A ring seal adapted for installation in an annular recess between a housing and a rotating or reciprocating shaft is described. The seal consists of a resilient ring cup member having a ring wedge member inserted in the center recess of the cup member to wedge the opposing lips of the cup member outwardly into a sealing

relationship. A spring maintains the force against the wedge member.

Official Gazette of the U.S. Patent and Trademark Office



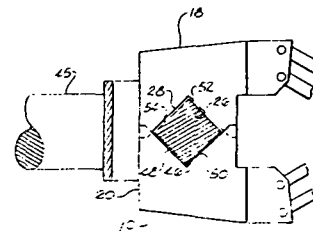
N84-11501* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

APPARATUS FOR ADAPTING AN END EFFECTOR DEVICE REMOTELY CONTROLLED MANIPULATOR ARM Patent Application

K. H. CLARK, inventor (to NASA) 30 Sep. 1983 14 p
(NASA-CASE-MFS-25949-1; US-PATENT-APPL-SN-538063)
Avail: NTIS HC A02/MF A01 CSCL 13I

Apparatus for adapting a general purpose and effector device to a special purpose and effector is disclosed which includes an adapter bracket assembly which provides a mechanical and electrical interface between the end effector devices. The adapter bracket assembly includes an adapter connector post which interlocks with a diamond shaped gripping channel formed in closed jaws and of the general purpose end effector. The angularly intersecting surfaces of the connector post and gripping channel prevent any relative movement therebetween. Containment webs constrain the outer finger plates of the general purpose jaws to prevent pitch motion. Electrical interface is provided by conical, self aligning electrical connector components carried by respective ones of said end effectors.

NASA



N84-12491* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

HOLDING FIXTURE FOR A HOT STAMPING PRESS Patent

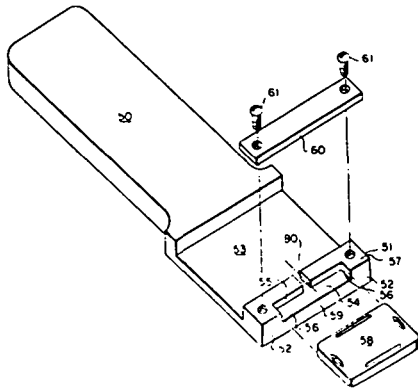
R. P. HARRIS, inventor (to NASA) 19 Jul. 1983 6 p Filed 16 Jan. 1981 Supersedes N81-16470 (19 - 07, p 0918)

(NASA-CASE-GSC-12619-1; US-PATENT-4,393,777;
US-PATENT-APPL-SN-225499; US-PATENT-CLASS-101-407BP;
US-PATENT-CLASS-269-3) Avail: US Patent and Trademark
Office CSCL 13I

A hand held guide for manually positioning a work piece between the anvil rib and tool of a hot die stamping press is described. A groove completed by interchangeable cover plates attached at one end of the guide conforms to a cross sectional dimension

common to similar workpieces and, with a force fit, retentively holds each of the workpieces.

Official Gazette of the U.S. Patent and Trademark Office



N84-12492* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

UNIDIRECTIONAL FLEXURAL PIVOT Patent

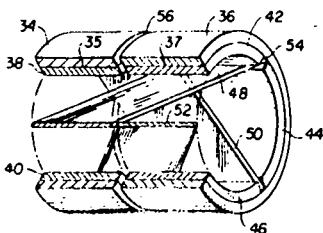
H. BAHIMAN, inventor (to NASA) 20 Sep. 1983 5 p Filed 16 Mar. 1981 Supersedes N81-22359 (19 - 13, p 1762)

(NASA-CASE-GSC-12622-1; US-PATENT-4,405,184; US-PATENT-APPL-SN-243684; US-PATENT-CLASS-308-2A)

Avail: US Patent and Trademark Office CSCL 131

A pair of generally coaxial mutually rotatable cylindrical outer ring members are held in spaced-apart relationship by three parallelogram-shaped, relatively thin, flexible, flat planar spring elements. These spring elements are substantially inextensible in length and are joined to the inside of the outer ring members and held in position by arcuate inner ring segments, three for each outer ring members, which respectively span an arc of substantially 120. The parallelogram shape of the spring elements provides a slanted interconnection between the outer ring members. The direction of slant, moreover, determines in which direction the spring elements can flex or bend unidirectionally to relieve the compression stress imparted thereto by any mutual angular rotation of the outer ring members.

Official Gazette of the U.S. Patent and Trademark Office



N84-12493* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

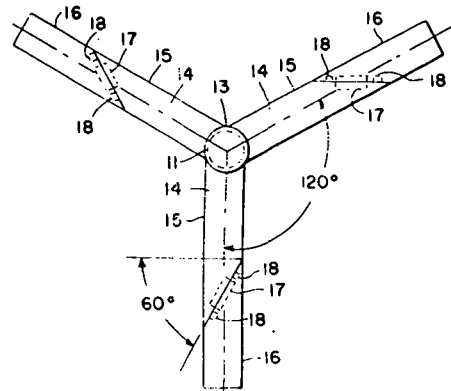
VERTICAL SHAFT WINDMILL Patent

D. C. GRANA and S. V. INGE, JR., inventors (to NASA) 15 Nov. 1983 4 p Filed 28 May 1982 Supersedes N82-29713 (20 - 20, p 2849)

(NASA-CASE-LAR-12923-1; US-PATENT-4,415,311; US-PATENT-APPL-SN-383063; US-PATENT-CLASS-416-117; US-PATENT-CLASS-416-132B) Avail: US Patent and Trademark Office CSCL 131

A vertical shaft has several equally spaced blades mounted. Each blade consists of an inboard section and an outboard section skew hinged to the inboard section. The inboard sections automatically adjust their positions with respect to the fixed inboard sections with changes in velocity of the wind. This windmill design automatically governs the maximum rotational speed of shaft.

Official Gazette of the U.S. Patent and Trademark Office



N84-16560* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

CLAMP-MOUNT DEVICE Patent

K. H. CLARK, inventor (to NASA) 27 Dec. 1983 5 p Filed 14 Aug. 1981 Supersedes N82-11470 (20 - 02, p 0207)

(NASA-CASE-MFS-25510-1; US-PATENT-4,422,609; US-PATENT-APPL-SN-293414; US-PATENT-CLASS-248-228)

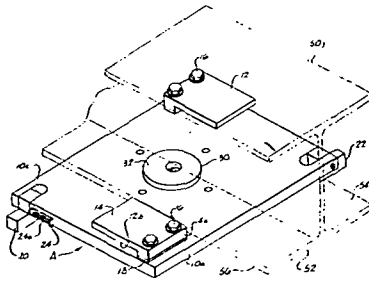
Avail: US Patent and Trademark Office CSCL 131

A clamp-mount device is disclosed for mounting equipment to an associated I-beam and the like structural member of the type having oppositely extending flanges wherein the device comprises a base and a pair of oppositely facing clamping members carried diagonally on the base clamping flanges therebetween and having flange receiving openings facing one another. Lock means are carried diagonally by the base opposite the clamping members locking the flanges in the clamping members. A resilient hub is carried centrally of the base engaging and biasing a back side of the flanges maintaining tightly clamped and facilitating use on vertical as well as horizontal members. The base turns about the hub to receive the flanges within the clamping members. Equipment may be secured to the base by any suitable means such as bolts in openings. Slidable gate latches secure the hinged locks in an upright locking position. The resilient hub includes a recess opening

37 MECHANICAL ENGINEERING

formed in the base and a rubber-like pad carried in this opening being depressably and rotatably carried therein.

Official Gazette of the U.S. Patent and Trademark Office



N84-16561* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

POWDER FED SHEARED DISPERSAL PARTICLE GENERATOR Patent

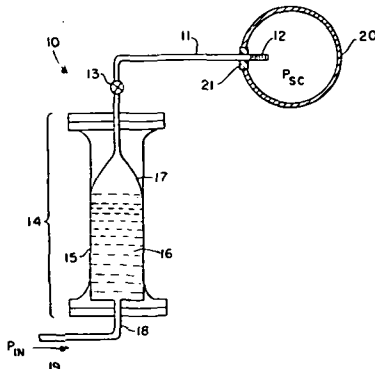
E. L. MORRISETTE and D. M. BUSHNELL, inventors (to NASA) 31 Jan. 1984 5 p Filed 28 Aug. 1981 Supersedes N82-24448 (20 - 15, p 2082)

(NASA-CASE-LAR-12785-1; US-PATENT-4,428,703; US-PATENT-APPL-SN-297488; US-PATENT-CLASS-406-155; US-PATENT-CLASS-239-568; US-PATENT-CLASS-241-95)

Avail: US Patent and Trademark Office CSCL 131

A particle generating system is described which is capable of breaking up agglomerations of particles and producing a cloud of uniform, submicron-sized particles at high pressure and high flow rates. This is achieved by utilizing a tubular structure which has injection microslits on its periphery to accept and disperse the desired particle feed. By supplying a carrying fluid at a pressure, of approximately twice the ambient pressure of the velocimeter's settling chamber, the microslits operate at choked flow conditions. The shearing action of this choked flow is sufficient to overcome interparticle bonding forces, thereby breaking up the agglomerates of the particles feed into individual particles.

Official Gazette of the U.S. Patent and Trademark Office



N84-20859*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

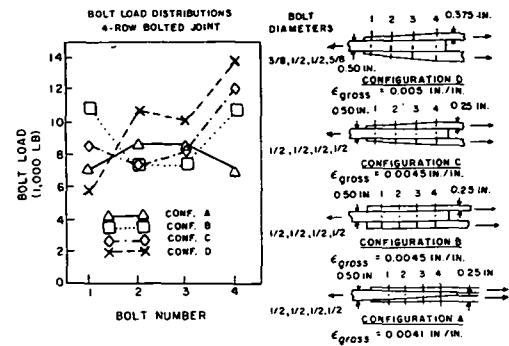
OPTIMIZED BOLTED JOINT Patent Application

L. J. HART-SMITH (McDonnell Douglas Corp., Long Beach, Calif.), B. L. BUNIN (McDonnell Douglas Corp., Long Beach, Calif.), and D. J. WATTS, inventors (to NASA) (McDonnell Douglas Corp.,

Long Beach, Calif.) 23 Jan. 1984 15 p Sponsored by NASA (NASA-CASE-LAR-13250-1; US-PATENT-APPL-SN-573162) Avail: NTIS HC A02/MF A01 CSCL 131

A method is disclosed for joining segments of the skin of an aircraft. The ends of the skin are positioned in close proximity or abutt each other. The skin is of constant thickness throughout the joint and is sandwiched between splice plates, which taper in thickness from the last to the first bolt rows in order to reduce the stiffness of the splice plate and thereby reduce the load transfer at the location where bypass loads are highest. The last row of bolts are in the thin end of the splice plates, and the first row of bolts are in the thick portion of the splice plate. The thicker portions of the splice plates also overlap the ends of the skin segments. Joint load is maximized by minimizing the bearing area at the splice plate location where the splice plate is thinnest, while maximizing the bypass load in the net skin section at the same location. Simultaneously, the bearing load in both the skin and the splice plate is maximized in the area where the splice plate is thickest.

NASA



N84-20860*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

SELF-INDEXING LATCH SYSTEM Patent Application

J. C. GIBSON, J. A. CALVERT, M. F. NESMITH, and R. A. CLOYD, inventors (to NASA) 15 Feb. 1984 17 p

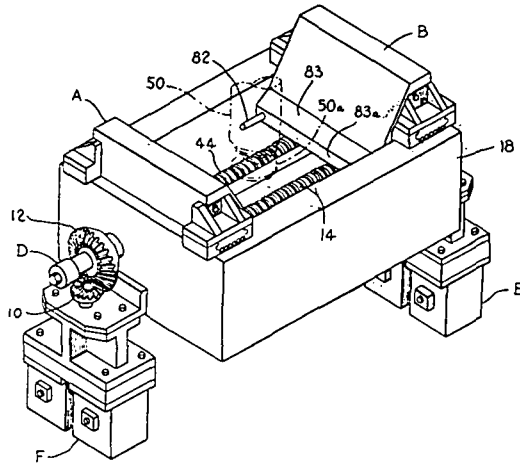
(NASA-CASE-MFS-25956-1; US-PATENT-APPL-SN-580397)

Avail: NTIS HC A02/MF A01 CSCL 131

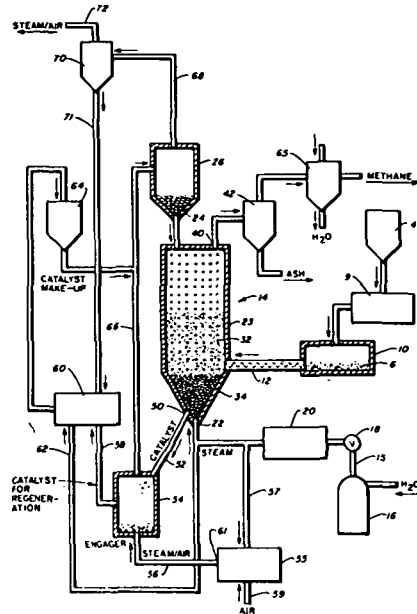
A self-latching jaw assembly is described which includes a pair of jaws for latching a fitting of an associated structure such as the keel fitting of a space telescope. The jaw assembly automatically locates the fitting received on a positioning pedestal and latches it in its original location on the pedestal without need of precision alignment. The first jaw is actuated and moved to the right whereupon a reciprocating plunger, extended from the nose of the jaw senses the hub of the spool. A jaw position responsive switch is then actuated to terminate the drive motor of the jaw. An astronaut then actuates the drive motor of the jaw and the jaw moves to the left whereupon standoff engages the face of

44 ENERGY PRODUCTION AND CONVERSION

the jaw in a latching position. In the latching position, the noses of the jaws are under the flanges of the spool. NASA



falling catalyst particles to form a methane gas product which is recovered after separation in separator. NASA



44

ENERGY PRODUCTION AND CONVERSION

Includes specific energy conversion systems, e.g., fuel cells and batteries; global sources of energy; fossil fuels; geophysical conversion; hydroelectric power; and wind power.

N84-12635* National Aeronautics and Space Administration. Pasadena Office, Calif.

FLUIDIZED BED GASIFICATION OF BIOMASS TO METHANE Patent Application

S. A. QADER, inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) 31 Oct. 1983 20 p (Contract NAS7-100)

(NASA-CASE-NPO-15903-1; US-PATENT-APPL-SN-547171)

Avail: NTIS HC A02/MF A01 CSCL 10A

Biomass particles are pelletized in pelletizer. The pellets form a fluidized bed of biomass in hot steam gas fed into the bottom inlet of a reactor. Catalyst particles shower downwardly through the reactor and are collected in an engager before recycle. The biomass particles are pyrolyzed to form char which is gasified by the steam to form CO and H₂ gas. This gas reacts with the

N84-14583* National Aeronautics and Space Administration. Pasadena Office, Calif.

PRESSURE LETDOWN METHOD AND DEVICE FOR COAL CONVERSION SYSTEMS Patent

J. M. KENDAL (JPL, California Inst. of Tech., Pasadena) and J. V. WALSH, inventors (to NASA) (JPL, California Inst. of Tech., Pasadena) 6 Dec. 1983 9 p Filed 30 Apr. 1981 Supersedes N81-33306 (19 - 24, p 3313) Sponsored by NASA

(NASA-CASE-NPO-15100-1; US-PATENT-4,418,722;

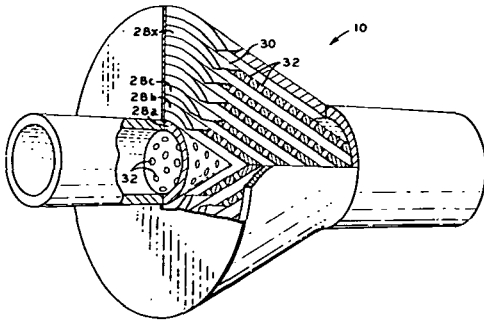
US-PATENT-APPL-SN-259211; US-PATENT-CLASS-138-42;

US-PATENT-CLASS-251-127) Avail: US Patent and Trademark Office CSCL 10A

In combination with a reactor for a coal utilization system, a pressure letdown device accepts from a reactor, a polyphase fluid at an entrance pressure and an entrance velocity, and discharges the fluid from the device at a discharge pressure substantially lower than the entrance pressure and at a discharge temperature and a discharge velocity substantially equal to the entrance temperature and entrance velocity. The device is characterized by a series of pressure letdown stages including several symmetrical baffles, disposed in coaxially nested alignment. In each baffle several ports or apertures of uniform dimensions are defined. The number of ports or apertures for each baffle plate is unique with respect to the number of ports or apertures defined in each of the other baffles. The mass rate of flow for each port is a function

44 ENERGY PRODUCTION AND CONVERSION

of the area of the port, the pressure of the fluid as applied to the port, and a common pressure ratio established across the ports.
Official Gazette of the U.S. Patent and Trademark Office



N84-20917*# National Aeronautics and Space Administration.
Pasadena Office, Calif.

INCREASED VOLTAGE PHOTOVOLTAIC CELL Patent Application

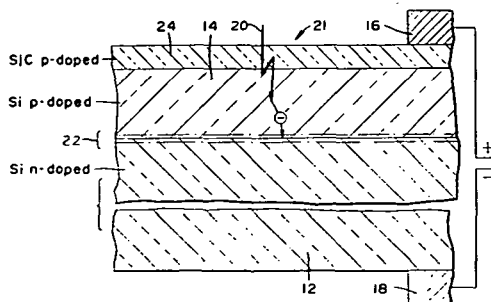
B. ROSS (JPL, California Inst. of Tech., Pasadena), D. B. BICKLER (JPL, California Inst. of Tech., Pasadena), and B. D. GALLAGHER, inventors (to NASA) (JPL, California Inst. of Tech., Pasadena) 8 Feb. 1984 10 p

(Contract NAS7-100)

(NASA-CASE-NPO-16155-1; US-PATENT-APPL-SN-578390)

Avail: NTIS HC A02/MF A01 CSCL 10A

A prior art solar cell which includes a silicon substrate and a silicon layer which are oppositely doped, one being p-doped and one being n-doped, is improved by including a second layer of silicon carbide on the first silicon layer. Preferably, the silicon carbide layer has the same type of doping as the silicon layer beneath it. The second layer increases the width of the depletion zone formed between the substrate and the first layer so that the voltage across the depletion zone can increase to a higher level and thus increase the voltage and efficiency of the photovoltaic cell. The carbon-containing second layer is desirable because a crystalline carbon such as silicon carbide is largely transparent to sunlight and allows large amounts of photons to pass through to produce a large current. NASA



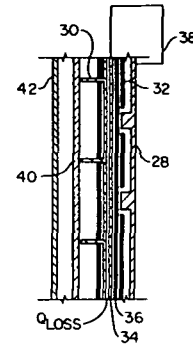
N84-20918*# National Aeronautics and Space Administration.
Lewis Research Center, Cleveland, Ohio.

THERMIONIC-PHOTOVOLTAIC ENERGY CONVERTER Patent Application

D. L. CHUBB, inventor (to NASA) 15 Feb. 1984 10 p
(NASA-CASE-LEW-14077-1; US-PATENT-APPL-SN-580573)

Avail: NTIS HC A02/MF A01 CSCL 10A

A thermionic photovoltaic energy conversion device comprised of a thermionic diode mounted within a hollow tubular photovoltaic converter is described. The thermionic diode maintains a cesium discharge for producing excited atoms that emit line radiation in the wave length region of 850 nm to 890 nm. The photovoltaic converter is a silicon or gallium arsenide photovoltaic cell having bandgap energies in this same wavelength region for optimum cell efficiency. NASA



45

ENVIRONMENT POLLUTION

Includes air, noise, thermal and water pollution; environment monitoring; and contamination control.

N84-12654* National Aeronautics and Space Administration.
National Space Technology Labs., Bay Saint Louis, Miss.

METHOD FOR TREATING WASTEWATER USING MICROORGANISMS AND VASCULAR AQUATIC PLANTS Patent

B. C. WOLVERTON, inventor (to NASA) 15 Nov. 1983 7 p
Filed 28 Dec. 1981 Supersedes N82-25335 (20 - 16, p 2214)

(NASA-CASE-NSTL-10; US-PATENT-4,415,450;

US-PATENT-APPL-SN-335036; US-PATENT-CLASS-210-602;

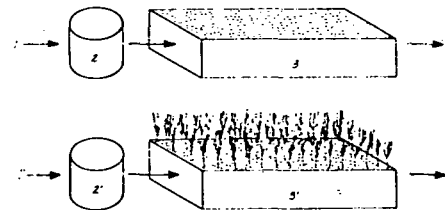
US-PATENT-CLASS-210-605; US-PATENT-CLASS-210-617;

US-PATENT-CLASS-210-151; US-PATENT-CLASS-47-58) Avail:

US Patent and Trademark Office CSCL 13B

A method for treating wastewater compresses subjecting the wastewater to an anaerobic setting step for at least 6 hours and passing the liquid effluent from the anaerobic settling step through a filter cell in an upflow manner. There the effluent is subjected first to the action of anaerobic and facultative microorganisms, and then to the action of aerobic microorganisms and the roots of at least one vascular aquatic plant.

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AEROSPACE MEDICINE

Includes physiological factors; biological effects of radiation; and weightlessness.

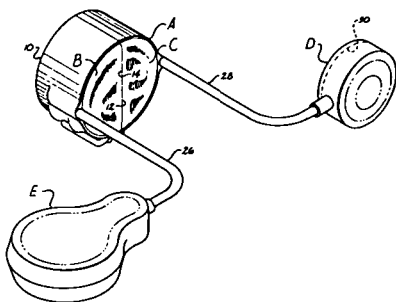
N84-11744* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

PROSTHETIC OCCLUSIVE DEVICE FOR AN INTERNAL PASSAGEWAY Patent

J. B. TENNEY, JR., inventor (to NASA) (Rochester General Hospital) 11 Oct. 1983 6 p Filed 23 Apr. 1982 Supersedes N82-26962 (20 - 17, p 2451) Sponsored by NASA (NASA-CASE-MFS-25740-1; US-PATENT-4,408,597; US-PATENT-APPL-SN-371352; US-PATENT-CLASS-128-1R; US-PATENT-CLASS-128-346; US-PATENT-CLASS-128-DIG.25) Avail: US Patent and Trademark Office CSCL 06E

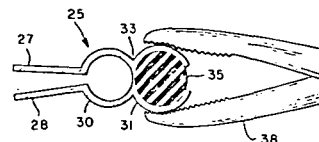
An occlusive device is disclosed for surgical implant to occlude the lumen of an internal organ. The device includes a cuff having a backing collar and two isolated cuff chambers. The fluid pressure of one chamber is regulated by a pump/valve reservoir unit. The other chamber is unregulated in pressure but its fluid volume is adjusted by removing or adding fluid to a septum/reservoir by means of a hypodermic needle. Pressure changes are transmitted between the two cuff chambers via faying surfaces which are sufficiently large in contact area and thin as to transmit pressure generally without attenuation. By adjusting the fluid volume of the septum, the operating pressure of the device may be adjusted to accommodate tubular organs of different diameter sizes as well as to compensate for changes in the organ following implant without reoperation.

Official Gazette of the U.S. Patent and Trademark Office



extending from the wall of one cavity. A silicone rubber pellet is disposed in the other cavity to exert a spring force through the hinge area to normally bias the jaws into contact with each other.

NASA



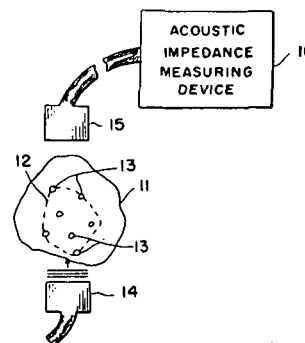
N84-21053*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

METHOD FOR THERMAL MONITORING SUBCUTANEOUS TISSUE Patent Application

J. S. HEYMAN and G. H. BRANDENBURG, inventors (to NASA) 22 Feb. 1984 10 p (NASA-CASE-LAR-13028-1; US-PATENT-APPL-SN-582492) Avail: NTIS HC A02/MF A01 CSCL 06B

A noninvasive accurate method for measuring the temperature of tissue beneath the surface of a living body is described. Ultrasonic signals are directed into beads of a material inserted into the tissue with a syringe. The reflected signals indicate the acoustic impedance or resonance frequency of the beads which in turn indicates the temperature of the tissue. A range of temperatures around the melting temperature of the material can be measured by this method.

NASA



N84-15764*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

LOW X-RAY ABSORPTION ANEURISM CLIPS Patent Application

R. M. BAUCOM, inventor (to NASA) 10 Feb. 1983 10 p (NASA-CASE-LAR-12650-2; US-PATENT-APPL-SN-465363) Avail: NTIS HC A02/MF A01 CSCL 06C

An X-ray transparent and biological inert medical clip for treating aneurisms and the like is disclosed as well as a process for its production. A graphite reinforced composite film is molded into a unitary structure having a pair of hourglass like cavities which are hinged together with a pair of jaws for grasping the aneurism

MAN/SYSTEM TECHNOLOGY AND LIFE SUPPORT

Includes human engineering; biotechnology; and space suits and protective clothing.

N84-11758* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

ABSORBENT PRODUCT AND ARTICLES MADE THEREFROM Patent

F. S. DAWN and J. V. CORREALE, inventors (to NASA) 25 Oct. 1983 5 p Filed 14 Apr. 1982 Supersedes N82-26960 (20 - 17, p 2450) Division of US Patent-4,338,371, Patent Appl-SN-219681, filed 24 Dec. 1981 Sponsored by NASA (NASA-CASE-MSC-18223-2; US-PATENT-4,411,660; US-PATENT-4,338,371; US-PATENT-APPL-SN-368187; US-PATENT-APPL-SN-219681; US-PATENT-CLASS-604-396; US-PATENT-CLASS-604-378; US-PATENT-CLASS-604-368) Avail: US Patent and Trademark Office CSCL 06K

A multilayer absorbent product for use in contact with the skin to absorb fluids is described. The product has a water pervious facing layer for contacting the skin, and a first fibrous wicking layer overlaying the water pervious layer. A first container section is defined by inner and outer layers of a water pervious wicking material in between a first absorbent mass and a second container section defined by inner and outer layers of a water pervious wicking material between what is disposed a second absorbent mass, and a liquid impermeable/gas permeable layer overlaying the second fibrous wicking layer.

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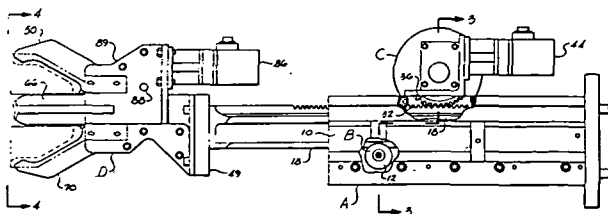


N84-11761* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

SELF-LOCKING TELESCOPING MANIPULATOR ARM Patent Application

M. F. NESMITH, inventor (to NASA) 30 Sep. 1983 14 p (NASA-CASE-MFS-25906-1; US-PATENT-APPL-SN-537757) Avail: NTIS HC A02/MF A01 CSCL 05H

A telescoping manipulator arm and pivotable finger assembly are disclosed. The telescoping arm assembly includes a generally T-shaped arm having three outwardly extending fingers guided on the grooved roller guides to compensate for environmental variations. The pivotable finger assembly includes four pivoting fingers. Arcuate teeth are formed on the ends of the fingers. A rack having teeth on four sides meshes with each one of the fingers. One surface of the rack includes teeth along its entire surface which mesh with teeth of the finger. The teeth at the remote end of the rack engage teeth of a gear wheel. NASA



N84-16803* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

METHOD AND APPARATUS FOR SIMULATING GRAVITATIONAL FORCES ON A LIVING ORGANISM Patent

W. E. THORNTON, inventor (to NASA) 20 Dec. 1983 9 p Filed 2 Sep. 1982 Supersedes N83-18254 (21 - 8, p 1240) (NASA-CASE-MSC-20202-1; US-PATENT-4,421,109; US-PATENT-APPL-SN-414106; US-PATENT-CLASS-128-15R; US-PATENT-CLASS-128-1A; US-PATENT-CLASS-128-38) Avail: US Patent and Trademark Office CSCL 05H

A method and apparatus for simulating gravitational forces on a living organism wherein a series of negative pressures are externally applied to successive length-wise sections of a lower limb of the organism. The pressures decreasing progressively with distance of said limb sections from the heart of the organism. A casing defines a chamber adapted to contain the limb of the organism and is rigidified to resist collapse upon the application of negative pressures to the interior of the chamber. Seals extend inwardly from the casing for effective engagement with the limb of the organism and, in cooperation with the limb, subdivide the chamber into a plurality of compartments each in negative pressure communicating relation with the limb.

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71

ACOUSTICS

Includes sound generation, transmission, and attenuation.

N84-14873* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

APPARATUS AND METHOD FOR JET NOISE SUPPRESSION Patent

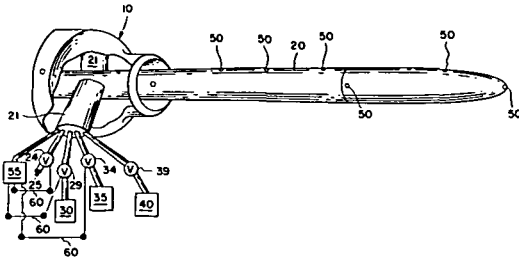
L. MAESTRELLO, inventor (to NASA) 16 Aug. 1983 9 p Filed 27 Feb. 1981 Supersedes N82-20465 (20 - 11, p 1504) Continuation of abandoned US Patent Appl. SN-753971, filed 23 Dec. 1976

(NASA-CASE-LAR-11903-2; US-PATENT-4,398,667; US-PATENT-APPL-SN-238791; US-PATENT-APPL-SN-753971; US-PATENT-CLASS-239-265.17) Avail: US Patent and Trademark Office CSCL 20A

A method and apparatus for jet noise suppression through control of the static pressure of the jet and control of the rate of entrainment of ambient fluid into the jet downstream of the exhaust nozzle is disclosed. The momentum flux over an extended region of the jet is regulated, affecting Reynolds stresses in the jet and the spreading angle of the jet. Static pressure is controlled through a long hollow, porous nozzle plug centerbody which may be selectively vented to ambient conditions, connected to a vacuum source, or supplied with fluids of various densities for injection into the stream. Sound in the jet may be channeled along the

nozzle plug centerbody by injecting coolant such as a cryogenic fluid throughout the center-body into the jet.

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N84-16940* National Aeronautics and Space Administration. Pasadena Office, Calif.

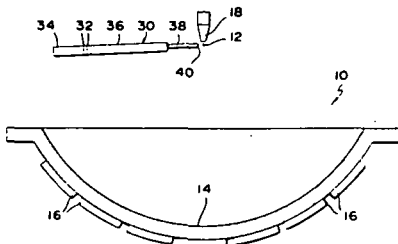
CONTACTLESS PELLET FABRICATION Patent

M. C. LEE, inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) 10 Jan. 1984 5 p Filed 26 Oct. 1981 Supersedes N83-17746 (21 - 08, p 1167)

(NASA-CASE-NPO-15592-1; US-PATENT-4,425,376; US-PATENT-APPL-SN-314702; US-PATENT-CLASS-427-57; US-PATENT-CLASS-65-213; US-PATENT-CLASS-427-6; US-PATENT-CLASS-427-346; US-PATENT-CLASS-427-421; US-PATENT-CLASS-427-426; US-PATENT-CLASS-118-50; US-PATENT-CLASS-118-50.1; US-PATENT-CLASS-118-57; US-PATENT-CLASS-118-62; US-PATENT-CLASS-118-300; US-PATENT-CLASS-118-500) Avail: US Patent and Trademark Office CSCL 20A

A small object is coated by holding it in the pressure well of an acoustic standing wave pattern, and then applying a mist of liquid coating material at low velocity into the pressure well. The pressure gradient within the well forces the mist particles to be pushed against the object. A lower frequency acoustic wave also can be applied to the coated object, to vibrate it so as to evenly distribute the coated material. The same lower frequency vibrations can be applied to an object in the shape of a hollow sphere, to center the inner and outer surfaces of the sphere while it remains suspended.

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N84-16948* National Aeronautics and Space Administration. Pasadena Office, Calif.

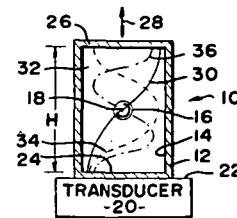
VIBRATING-CHAMBER LEVITATION SYSTEMS Patent Application

M. B. BARMATZ (JPL, California Inst. of Tech., Pasadena), D. GRANETT (JPL, California Inst. of Tech., Pasadena), and M. C. LEE, inventors (to NASA) (JPL, California Inst. of Tech., Pasadena) 14 Dec. 1983 13 p (Contract NAS7-918)

(NASA-CASE-NPO-16142-1; US-PATENT-APPL-SN-561433)

Avail: NTIS HC A02/MF A01 CSCL 20A

A housing, forming a chamber, is mounted on an acoustic transducer. The transducer shakes the entire housing up and down, so that, at a proper resonant frequency, a standing wave pattern is set up in the chamber to levitate an object. The resonant frequency can be the lowest one whose wavelength equals twice the height of the chamber, or any multiple of that frequency. For a rectangular chamber, a single frequency can be used to hold an object along three dimensions by orienting the chamber so that all three axes are tilted from the vertical. In a largely cylindrical chamber, an object can be held at a particular position by curving the axis of the cylinder. The object then lies at the lowest position along the axis. A heated chamber can be vibrated by a colder transducer by using a horn to connect them. NASA



N84-16949* National Aeronautics and Space Administration. Pasadena Office, Calif.

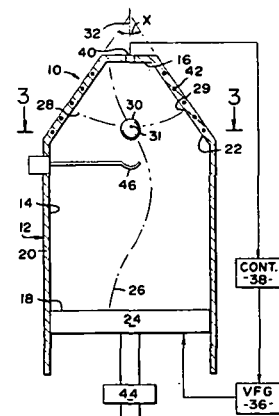
GRAVITY ENHANCED ACOUSTIC LEVITATION METHOD AND APPARATUS Patent Application

M. B. BARMATZ (JPL, California Inst. of Tech., Pasadena), J. L. ALLEN (JPL, California Inst. of Tech., Pasadena), and D. GRANETT, inventors (to NASA) (JPL, California Inst. of Tech., Pasadena) 9 Dec. 1983 11 p (Contract NAS7-100)

(NASA-CASE-NPO-16147-1; US-PATENT-APPL-SN-559988)

Avail: NTIS HC A02/MF A01 CSCL 20A

An acoustic levitation system is provided by applying a single frequency from a transducer into a resonant chamber surrounding the object. The chamber walls are angled so they converge in an upward direction. When an acoustic standing wave pattern is applied between the top and bottom of the chamber, a levitation surface within the stabilizer does not lie on a horizontal plane, but instead is curved with a lowermost portion near the vertical axis of the chamber. As a result, an acoustically levitated object is urged by gravity towards the lowermost location on the levitation surface, so the object is kept away from the side walls of the chamber. NASA



71 ACOUSTICS

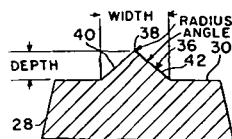
N84-21274*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

ULTRASONIC ANGLE BEAM STANDARD REFLECTOR Patent Application

R. F. BERRY, JR., inventor (to NASA) 21 Mar. 1984 9 p (NASA-CASE-LAR-13153-1; US-PATENT-APPL-SN-590921)

Avail: NTIS HC A02/MF A01 CSCL 20A

A method that provides an impression profile in a reference standard material utilized in inspecting critically stressed components with pulsed ultrasound was described. A die stamp having an I letter was used to impress the surface of a reference material. The die stamp was placed against the surface and struck with an inertia imparting member to impress the I in the reference standard material. Upset may appear on the surface as a result of the impression and is removed to form a smooth surface. The stamping and upset removal is repeated until the entire surface area of a depth control platform on the die stamp uniformly contacts the material surface. The I impression profile in the reference standard material is utilized for reflecting pulsed ultrasonic beams for inspection purposes. NASA



72

ATOMIC AND MOLECULAR PHYSICS

Includes atomic structure and molecular spectra.

N84-16959*# National Aeronautics and Space Administration. Pasadena Office, Calif.

ION BEAM ACCELERATOR SYSTEM Patent Application

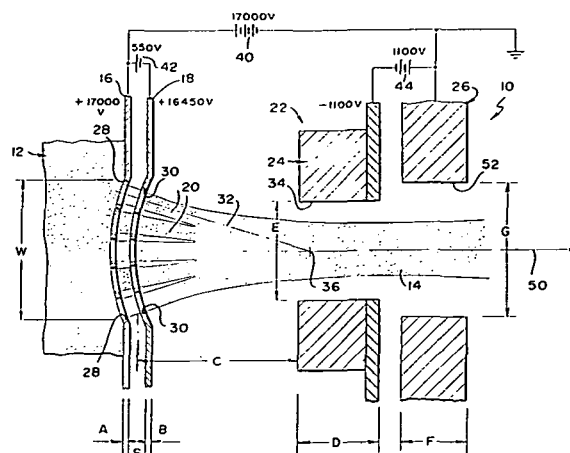
G. ASTON, inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) 22 Jun. 1981 11 p Sponsored by NASA (NASA-CASE-NPO-15547-1; US-PATENT-APPL-SN-276076)

Avail: NTIS HC A02/MF A01 CSCL 20H

A system is described that combines geometrical and electrostatic focusing to provide high ion extraction efficiency and good focusing of an accelerated ion beam. The apparatus includes a pair of curved extraction grids with multiple pairs of aligned holes positioned to direct a group of beamlets along converging paths. The extraction grids are closely spaced and maintained at a moderate potential to efficiently extract beamlets of ions and allow them to combine into a single beam. An accelerator electrode device downstream from the extraction grids is at a much lower potential than the grids to accelerate the combined beam. The

application of the system to ion implantation is mentioned.

NASA



74

OPTICS

Includes light phenomena.

N84-11920* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

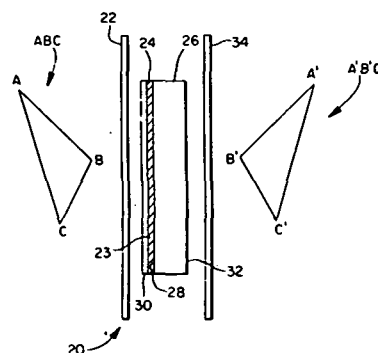
REAL-TIME 3-D X-RAY AND GAMMA-RAY VIEWER Patent

L. I. YIN, inventor (to NASA) 13 Sep. 1983 8 p Filed 22 May 1981 Supersedes N82-10862 (20 - 01, p 0121)

(NASA-CASE-GSC-12640-1; US-PATENT-4,404,469; US-PATENT-APPL-SN-267178; US-PATENT-CLASS-250-363R; US-PATENT-CLASS-250-363S; US-PATENT-CLASS-250-368; US-PATENT-CLASS-378-2) Avail: US Patent and Trademark Office CSCL 20F

A multi-pinhole aperture lead screen forms an equal plurality of invisible mini-images having dissimilar perspectives of an X-ray and gamma-ray emitting object (ABC) onto a near-earth phosphor layer. This layer provides visible light mini-images directly into a visible light image intensifier. A viewing screen having an equal number of dissimilar perspective apertures distributed across its face in a geometric pattern identical to the lead screen, provides a viewer with a real, pseudoscopic image (A'B'C') of the object with full horizontal and vertical parallax. Alternatively, a third screen identical to viewing screen and spaced apart from a second visible light image intensifier, may be positioned between the first image intensifier and the viewing screen, thereby providing the viewer with a virtual, orthoscopic image (A'B'C') of the object (ABC) with full horizontal and vertical parallax.

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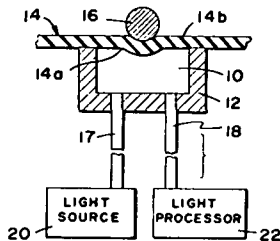
N84-11921* National Aeronautics and Space Administration. Pasadena Office, Calif.

OPTICAL FIBER TACTILE SENSOR Patent

A. K. BEJCZY, inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) 20 Sep. 1983 8 p Sponsored by NASA (NASA-CASE-NPO-15375-1; US-PATENT-4,405,197; US-PATENT-APPL-SN-210405; US-PATENT-CLASS-350-96.15; US-PATENT-CLASS-3-1.1; US-PATENT-CLASS-73-432T; US-PATENT-CLASS-250-227; US-PATENT-CLASS-350-96.10)
 Avail: US Patent and Trademark Office CSCL 20F

A tactile sensor comprises an array of cells which are covered by an elastic membrane, having an exposed surface which is adapted to come in contact with an object. Light is conducted to each cell from a light source by an optical fiber which terminates at the cell. Reflected light from the cell is conducted by an optical fiber to a light processor, which senses changes in the light received thereby from an ambient level whenever an object comes in contact with the membrane surface above the cell.

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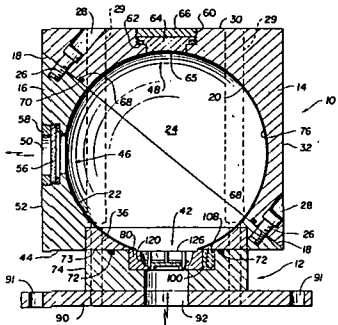
N84-15960*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

OPTICAL MULTIPLE SAMPLE VACUUM INTEGRATING SPHERE Patent Application

C. L. BUTNER, inventor (to NASA) 30 Nov. 1983 13 p (NASA-CASE-GSC-12849-1; US-PATENT-APPL-SN-556481)
 Avail: NTIS HC A02/MF A01 CSCL 20F

An integrating sphere, comprised of a uniform diffusely reflecting spherical cavity, has mutually transverse input and output ports. A linear sample transport mechanism is secured to the sphere so that the multiple samples can be brought into registration with the input port, one at a time, without having to open or disassemble the apparatus when a change of a sample is desired. A vacuum tight seal provided between the cavity and transport mechanism maintains the integrity of a vacuum generated within the sphere when it is attached to the source of optical energy. The device is utilized, for example, to test the emissive characteristic such as the relative fluorescence quantum efficiency of a dye sample placed in the path of a monochromatic optical energy source coupled to the input port while having a light detector coupled to the output port.

NASA



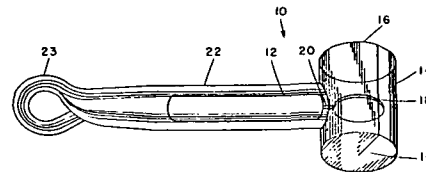
N84-16986*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

HIGH-TEMPERATURE, HIGH-PRESSURE OPTICAL CELL Patent Application

L. R. HOLLAND (Alabama Univ., Huntsville), R. P. HARRIS, and R. E. SMITH, inventors (to NASA) (Alabama Univ., Huntsville) 17 Jan. 1984 15 p (NASA-CASE-MFS-26000-1; US-PATENT-APPL-SN-571615)
 Avail: NTIS HC A02/MF A01 CSCL 20F

An optical cell which has the capability of containing chemicals under high temperature and high pressure yet has flat optical windows allowing light to pass through the cell without distortion is presented. The cell may be embodied as a high pressure discharge tube in a high pressure gas laser, with windows polished to the Brewster angle.

NASA



75

PLASMA PHYSICS

Includes magnetohydrodynamics and plasma fusion.

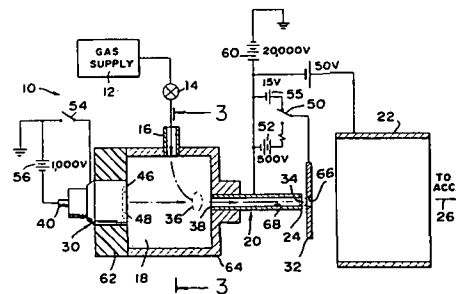
N84-16993*# National Aeronautics and Space Administration. Pasadena Office, Calif.

HOLLOW CATHODE APPARATUS Patent Application

G. ASTON, inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) 22 Jun. 1981 10 p Sponsored by NASA (NASA-CASE-NPO-15560-1; US-PATENT-APPL-SN-275909)
 Avail: NTIS HC A02/MF A01 CSCL 20I

A hollow cathode apparatus is described, which is rapidly and reliably started. An ignitor positioned upstream from the hollow cathode, generates a puff of plasmas that flows with the primary gas to be ionized through the cathode. The plasma puff creates a high voltage breakdown between the downstream end of the cathode and a keeper electrode, to heat cathode to an electron-emitting temperature.

NASA



76

SOLID-STATE PHYSICS

Includes superconductivity.

N84-12968*# National Aeronautics and Space Administration. Pasadena Office, Calif.

METHOD AND APPARATUS FOR MINIMIZING CONVECTION DURING CRYSTAL GROWTH FROM SOLUTION Patent Application

P. J. SHLICHTA, inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) 31 Oct. 1983 23 p

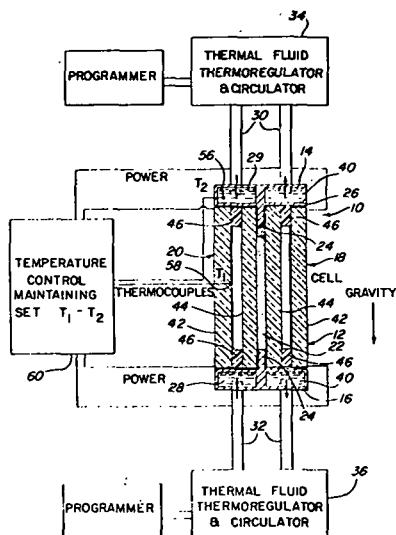
(Contract NAS7-100)

(NASA-CASE-NPO-15811-1; US-PATENT-APPL-SN-547175)

Avail: NTIS HC A02/MF A01 CSCL 20B

A method and apparatus are disclosed for growing in a gravitational field a microscopic crystal from a solution. The solution is held in a vertical chamber which is relatively thin, the thin being generally perpendicular to the vertical. There is a substrate crystal disposed at either the upper or lower end of the chamber and the crystal grows from this substrate crystal in one direction. The temperature conditions of the solution are controlled so that, as the crystal forms, the effects of buoyant convection within the solution are minimized. This is accomplished in two different ways depending upon whether the crystal is grown from the upper or lower end of the chamber. When grown from the upper end of the chamber, the temperature of the solution is controlled so that it remains essentially isothermal so that there is essentially no heat loss from the solution. When the crystal is grown from the lower end of the chamber, the temperature of the solution is controlled so that there is a differential in temperature throughout the solution which provides a positive thermal gradient within the chamber.

NASA



N84-22457*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

LIQUID CRYSTAL LIGHT VALVE STRUCTURES Patent Application

N. J. KODA, inventor (to NASA) (Hughes Aircraft Co., Culver City, Calif.) 9 Jan. 1984 7 p Sponsored by NASA

(NASA-CASE-MSC-20036-1; US-PATENT-APPL-SN-569372)

Avail: NTIS HC A02/MF A01 CSCL 20L

A liquid crystal light valve is a multilayer structure containing as one of its layers a transparent conductor or electrode film on which was deposited a photosensor layer. A commonly used material for the photosensor layer is cadmium sulfide (CdS). In accordance with the present invention, an improved photosensor layer or film for use in liquid crystal light valves is prepared by sputter depositing CdS onto an ITO substrate in an atmosphere of Argon/H₂S gas while maintaining the ambient temperature for the substrate in the range of from about 130 C to about 200 C.

During sputter deposition, nitrogen gas is introduced into the system as a dopant to the extent of not more than about 1% of total gaseous or plasma mixture. Following deposition of the CdS film, the film is annealed in an inert gas, such as argon, at a temperature ranging from about 300 C to about 425 C. Photosensor layers or films so prepared, and liquid crystal light valves embodying such photosensors, exhibited significantly reduced image retention times (negative memory) while retaining acceptable photosensitivity.

Author

89

ASTRONOMY

Includes radio and gamma-ray astronomy; celestial mechanics; and astrometry.

N84-17084*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

SPECTRAL SLICING X-RAY TELESCOPE WITH VARIABLE MAGNIFICATION Patent Application

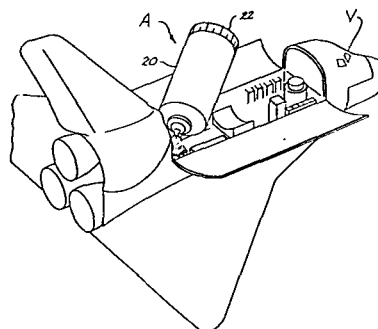
R. B. HOOVER and E. HILDNER, inventors (to NASA) 17 Jan. 1984 20 p

(NASA-CASE-MFS-25942-1; US-PATENT-APPL-SN-571613)

Avail: NTIS HC A02/MF A01 CSCL 20F

A telescope for viewing high frequency radiation (soft X-ray, extreme ultraviolet) is described. This telescope has a long focal length with a selection of magnifications despite a short housing. Light enters the telescope and is reflected by the telescope's primary optical system to one of several secondary mirrors at different locations on a movable frame. The secondary mirrors having varying degrees of magnification and select narrow spectral slices of the incident radiation. Thus, both the magnification and effective focal length field of view and wavelength can be altered by repositioning the moving frame. Configurations for spaceborne applications are discussed.

NASA



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